



Farmington River Watershed Summary

Farmington River (Segment 2), Munnisunk Brook, Owens Brook, Russell Brook, and Minister Brook

WATERSHED DESCRIPTION AND MAPS

The Farmington River watershed covers an area of approximately 67,451 acres in the mid-northern portion of Connecticut (Figure 1). The watershed spans several Connecticut towns, including Windsor Locks, Windsor, East Granby, Granby, Bloomfield, Simsbury, Avon, Farmington, Burlington, Canton, New Hartford, Barkhamsted, Hartland, and Colebrook, and the northern portion of the watershed extends into southern Massachusetts.

The Farmington River watershed includes five segments impaired for recreation due to elevated bacteria levels. These segments were assessed by Connecticut Department of Energy and Environmental Protection (CT DEEP) and included in the CT 2010 303(d) list of impaired waterbodies. The other segments (CT4300-00_01, CT4300-00_03, CT4300-00_04, and CT4300-00_05) in the watershed are currently unassessed for recreation or fully supporting designated uses for recreation as of the writing of this document. This does not mean that there are no potential issues on these segments, but indicates a lack of current data to evaluate the segments as part of the assessment process. An excerpt of the Integrated Water Quality Report is included in Table 1 to show the status of other waterbodies in the watershed (CTDEEP, 2010).

The Farmington River is split into east and west branches. The west branch begins in the Berkshire Mountains of southwestern Massachusetts, impounds at Colebrook River Lake at the Connecticut-Massachusetts border, continues south through northeastern Colebrook, southwestern Hartland, western Barkhamsted, and northeastern New Hartford, and converges with the east branch of the Farmington River. The east branch begins just below the state line of Connecticut at the impoundment of Barkhamsted Reservoir and Lake McDonough, and converges with the west branch of the Farmington River in New Hartford. The joined rivers continue south through

Impaired Segment Facts

Impaired Segments:

1. Farmington River (Segment 2) (CT4300-00_02)
2. Munnisunk Brook (CT4300-44_01)
3. Owens Brook (CT4300-39_01)
4. Russell Brook (CT4300-33_01)
5. Minister Brook (CT4300-32_01)

Municipalities: Bloomfield, East Granby, Simsbury, Avon, Farmington, Burlington

Impaired Segment Length (miles): 4300-00_02 (19.38), 4300-44_01 (0.87), 4300-39_01 (1.05), 4300-33_01 (1.25), 4300-32_01 (1.82)

Water Quality Classification: Class B (1), Class A (2-5)

Designated Use Impairment: Recreation

Sub-regional Basin Name and Code: Farmington River, 4300

Regional Basin: Farmington

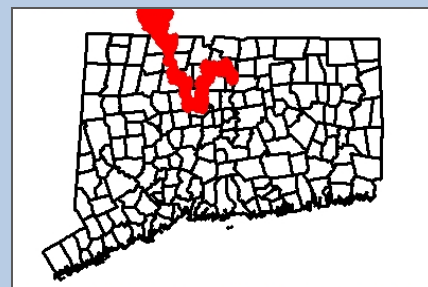
Major Basin: Connecticut

Watershed Area (acres): 67,451

MS4 Applicable? Yes

Applicable Season: Recreation Season (May 1 to September 30)

Figure 1: Watershed location in Connecticut



northeastern New Hartford and southwestern Canton, follow the Burlington-Avon border, cut diagonally through Farmington, and turn north to flow through eastern Avon and eastern Simsbury. The Farmington River then turns east following the East Granby-Simsbury and East Granby-Bloomfield border, and ends at its confluence with the Connecticut River in eastern Windsor.

The Farmington River (Segment 2) (CT4300-00_02) consists of 19.38 miles of river in Bloomfield, East Granby, Simsbury, Avon, and Farmington (Figure 2). The Farmington River (Segment 2) begins at the confluence with the Pequabuck River in Farmington, turns north and flows through eastern Simsbury and eastern Avon, flows east following the Bloomfield-East Granby and Simsbury-East Granby borders, and ends at the inlet to Rainbow Reservoir at the Route 187 crossing in Bloomfield.

Munnisunk Brook (CT4300-44_01) consists of 0.87 miles of the river in Simsbury. Munnisunk Brook flows 0.87 miles, begins at the Lake Basile Dam outlet just upstream of the Wolcott Road crossing in Simsbury, flows past the Simsbury Airport, and ends at the confluence with the Farmington River in northeastern Simsbury.

Owens Brook (CT4300-39_01) consists of 1.05 miles of the river in Simsbury. Owens Brook begins between the intersections of Musket Trail and Winterset Lane with Owens Brook Boulevard in Simsbury, flows along Owens Brook Boulevard, and ends at the confluence with the Farmington River downstream of the Route 10 (US 202) crossing in Simsbury.

Russell Brook (CT4300-33_01) consists of 1.25 miles of the river in Simsbury. Russell Brook begins at White Foundation Pond in Simsbury, crosses Deer Park Road, flows through Weatogue Park and the Latimer Lane Elementary School property, and ends at the confluence with the Farmington River downstream of Route 185 (Hartford Road) crossing in Simsbury.

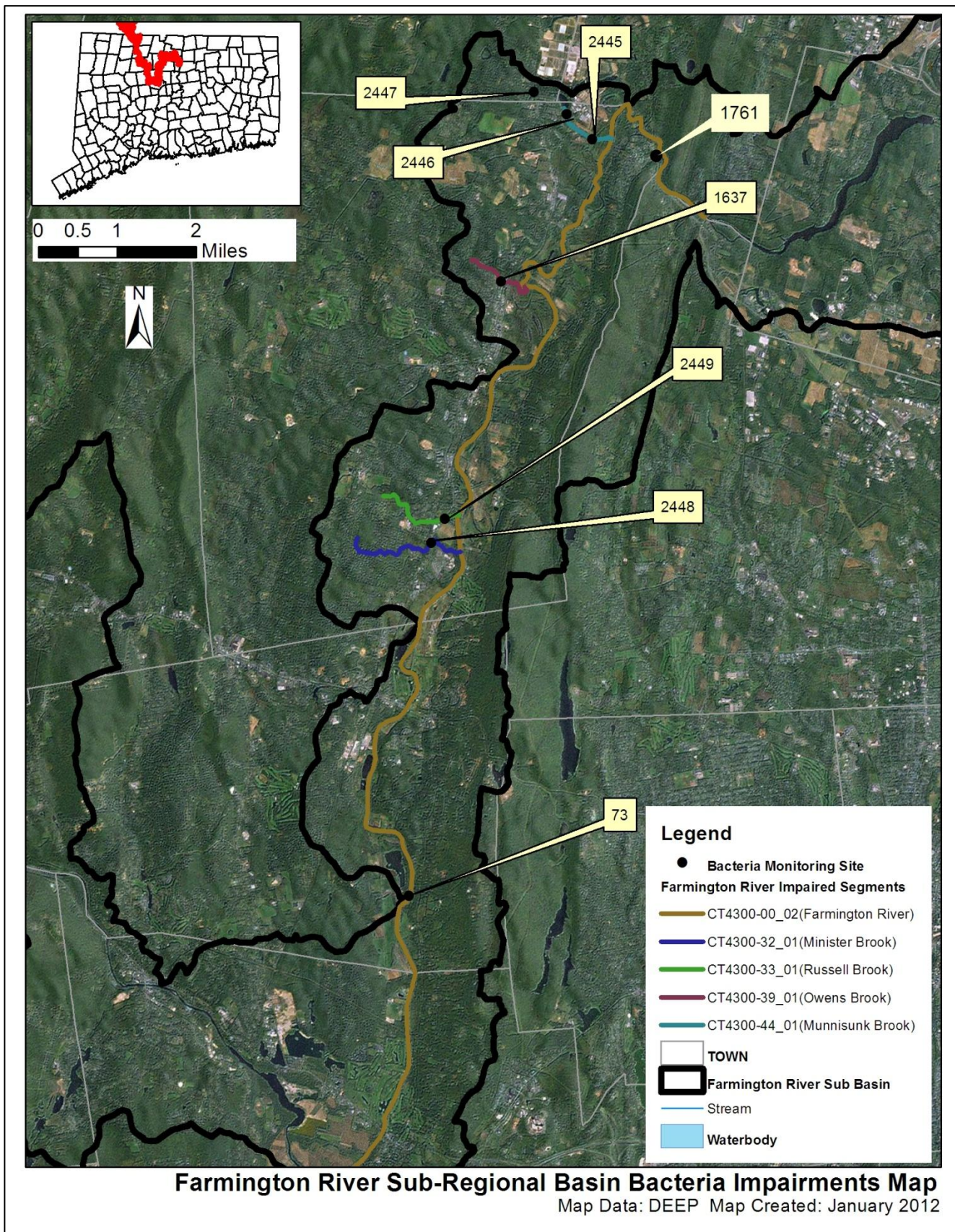
Minister Brook (CT4300-32_01) consists of 1.82 miles of the river in Simsbury. Minister Brook begins just east of Pine Glen Road in Simsbury, crosses Red Stone Drive, Valley View Drive, Farmington Canal Heritage Trail, and Route 10 (US 202), and ends at the confluence with the Farmington River.

The Farmington River (Segment 2) has a water quality classification of B. Designated uses include habitat for fish and other aquatic life and wildlife, recreation, and industrial and agricultural water supply. Munnisunk Brook, Owens Brook, Russell Brook, and Minister Brook have a water quality classification of A. Designated uses include potential drinking water supplies, habitat for fish and other aquatic life and wildlife, recreation, navigation, and industrial and agricultural water supply. As there are no designated beaches in these segments of the Farmington River, the specific recreation impairment is for non-designated swimming and other water contact related activities.

Table 1: Impaired segments and nearby waterbodies from the Connecticut 2010 Integrated Water Quality Report

| Waterbody ID | Waterbody Name | Location | Miles | Aquatic Life | Recreation | Fish Consumption |
|--|-------------------------------|--|-------|--------------|------------|------------------|
| CT4300-00_01 | Farmington River-01 | From mouth at Connecticut River, US to Rainbow Reservoir dam outlet, Windsor. | 8.59 | NOT | U | FULL |
| CT4300-00_02 | Farmington River-02 | From inlet to Rainbow Reservoir (Route 187 crossing), Bloomfield, US to confluence with the Pequabuck River, Farmington. | 19.38 | FULL | NOT | FULL |
| CT4300-00_03 | Farmington River-03 | From confluence with the Pequabuck River, Farmington, US to Lower Collinsville Dam (Collins Company Lower Dam, along Route 179), Burlington. | 8.46 | FULL | FULL | FULL |
| CT4300-00_04 | Farmington River-04 | From Lower Collinsville dam (Collins Company Lower Dam near Route 179), Burlington, US to confluence with Still River, Barkhamsted. | 15.01 | FULL | U | FULL |
| CT4300-00_05 | Farmington River-05 | From confluence with Still River, Barkhamsted, US to West Branch Reservoir outlet (Hogback Dam, just US of Durst Road crossing), Hartland. | 2.41 | U | FULL | FULL |
| CT4300-44_01 | Munnisunk Brook (Simsbury)-01 | From mouth at confluence with Farmington River, US to Lake Basile Dam outlet (US of Wolcott Road and Rail Road crossings), Simsbury. | 0.89 | U | NOT | FULL |
| CT4300-39_01 | Owens Brook (Simsbury)-01 | Mouth on Farmington River, DS of Route 10 (US 202) crossing, US to HW parallel to Owens Brook Boulevard, between Musket Trail and Winterset Lane intersections with Owens Brook Boulevard, Simsbury. | 1.05 | U | NOT | FULL |
| CT4300-33_01 | Russell Brook (Simsbury)-01 | Mouth on Farmington River, DS of Route 189 crossing, US to HW at White Foundation Pond, parallel to Deer Park Road, Simsbury. | 1.25 | U | NOT | FULL |
| CT4300-32_01 | Minister Brook (Simsbury)-01 | Mouth on Farmington River, DS of Route 189 crossing, US to HW just east of Pine Glen Road, Simsbury. | 1.82 | U | NOT | FULL |
| Shaded cells indicate impaired segment addressed in this TMDL FULL = Designated Use Fully Supported NOT = Designated Use Not Supported U = Unassessed | | | | | | |

Figure 2: GIS map featuring general information of the Farmington River watershed at the sub-regional level



Land Use

Existing land use can affect the water quality of waterbodies within a watershed (USEPA, 2011c). Natural processes, such as soil infiltration of stormwater and plant uptake of water and nutrients, can occur in undeveloped portions of the watershed. As impervious surfaces (such as rooftops, roads, and sidewalks) increase within the watershed landscape from commercial, residential, and industrial development, the amount of stormwater runoff to waterbodies also increases. These waterbodies are negatively affected as increased pollutants from nutrients and bacteria from failing and insufficient septic systems, oil and grease from automobiles, and sediment from construction activities become entrained in this runoff. Agricultural land use activities, such as fertilizer application and manure from livestock, can also increase pollutants in nearby waterbodies (USEPA, 2011c).

As shown in Figures 3 and 4, the Farmington River watershed consists of 58% forest, 26% urban, 9% agriculture, and 7% water land uses. The Farmington River (Segment 2) begins in a large agricultural area characterized by row crops and hayfields, flows downstream through the Farmington Country Club golf course, the Farmington Polo Grounds equestrian center, and the Farmington Club for large banquets and conferences. Downstream of Fisher Meadow Pond, the Farmington River (Segment 2) continues through larger forested tracts and rural residential development before crossing the urbanized Route 10 (US 44) East Main Street area that runs into Blue Fox Run Golf Course and Tower Ridge Country Club. The downstream portion of the Farmington River (Segment 2) in Simsbury and East Granby consists primarily of hayfields and forested open spaces, including Drake Hill Park, St. Johns Place Open Space, Curtiss Park, Wardell-Saint Johns Open Space, Pickerel Cove, Tariffville Park, Cowles Park, and Wilcox Park.

Munnisunk Brook begins at the outlet to Lake Basile and flows through a buffer of forested area mixed with suburban residential development. Munnisunk Brook continues just south of Simsbury Airport and the Theatre Guild of Simsbury through a mowed agricultural area before reaching its confluence with the Farmington River. Owens Brook begins in a mixed forested-suburban residential development area before crossing the commercialized area surrounding Route 10 (US 202). A wetland complex provides buffer between the developed area and the main stem of the Farmington River. Russell Brook begins in a forested area along Deer Park Road, flows into dense suburban residential development, and crosses Route 10 (US 202) before its confluence with the Farmington River. Minister Brook begins in a rural residential development area with forested buffer, continues through a wetland just north of an apartment complex, crosses Route 10 (US 202) through adjacent forested tracks, flows just north of a large commercial building (The Hartford), and then joins with the Farmington River.

Figure 3: Land use within the Farmington River watershed

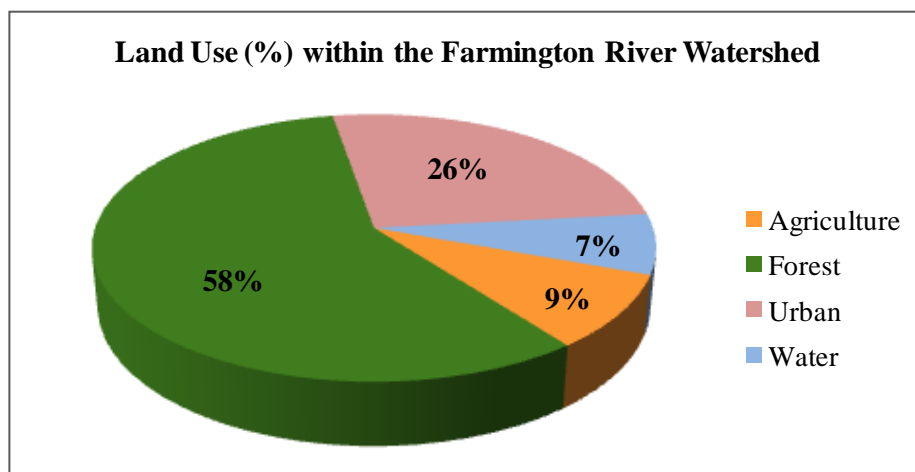
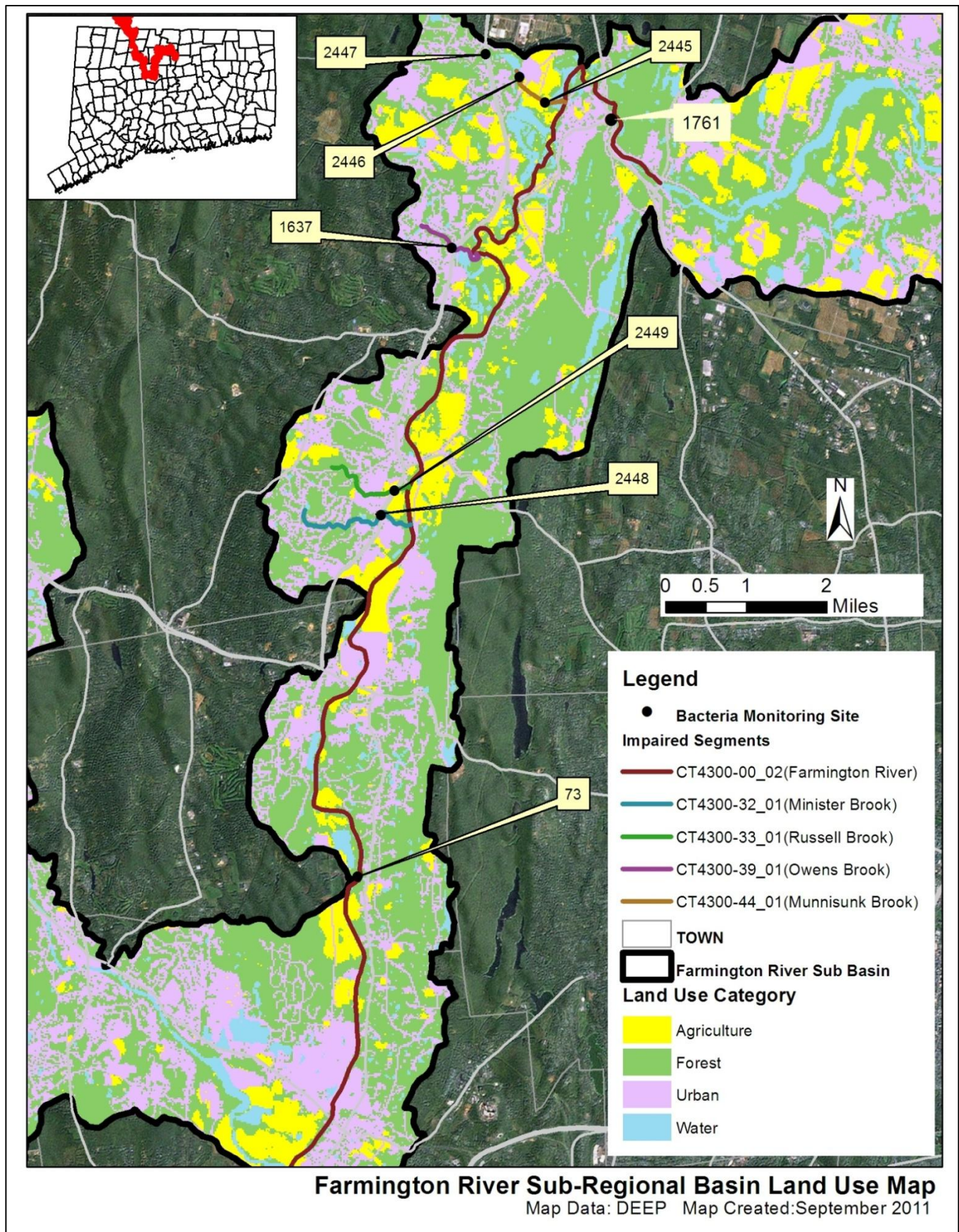


Figure 4: GIS map featuring land use for the Farmington River watershed at the sub-regional level



WHY IS A TMDL NEEDED?

E. coli is the indicator bacteria used for comparison with the CT State criteria in the CT Water Quality Standards (WQS) (CTDEEP, 2011). All data results are from CT DEEP, USGS, Bureau of Aquaculture, or volunteer monitoring efforts at stations located on the impaired segments.

Table 2: Sampling station location description for impaired segments in the Farmington River watershed

| Waterbody ID | Waterbody Name | Station | Station Description | Municipality | Latitude | Longitude |
|--------------|------------------------------|---------|--|--------------|-----------|------------|
| CT4300-00_02 | Farmington River (Segment 2) | 73 | Old Farms Road | Avon | 41.772286 | -72.822000 |
| | | 1761 | Farmington River at Tariffville | Simsbury | 41.90833 | -72.76111 |
| CT4300-44_01 | Munnisunk Brook | 2445 | Town Farm Dairy | Simsbury | 41.911410 | -72.777036 |
| CT4300-44_01 | Munnisunk Brook | 2446 | Rail Trail | Simsbury | 41.915972 | -72.783261 |
| CT4300-44_01 | Munnisunk Brook | 2447 | Route 10 | Granby | 41.920054 | -72.791391 |
| CT4300-39_01 | Owens Brook | 1637 | Route 10 | Simsbury | 41.885278 | -72.799444 |
| CT4300-33_01 | Russell Brook | 2449 | Weatogue Park and Route 10 | Simsbury | 41.841626 | -72.813242 |
| CT4300-32_01 | Minister Brook | 2448 | Latimer Lane at Intersection of Route 10 | Simsbury | 41.837233 | -72.816491 |

The Farmington River (Segment 2) is a Class B freshwater river (Figure 5). The applicable designated uses are habitat for fish and other aquatic life and wildlife, recreation, and industrial and agricultural water supply. Munnisunk Brook, Owens Brook, Russell Brook, and Minister Brook have a water quality classification of A. Designated uses include potential drinking water supplies, habitat for fish and other aquatic life and wildlife, recreation, navigation, and industrial and agricultural water supply. Water quality analyses were conducted using data from Station 73 and 1761 on the Farmington River (Segment 2) in 1998, 1999, 2009, 2010, and 2011, from Stations 2445, 2446, and 2447 on Munnisunk Brook from 2007-2009, from Station 1637 on Owens Brook from 2007-2009, from Station 2449 on Russell Brook from 2007-2009, and from Station 2448 on Minister Brook from 2007-2009 (Table 2).

For Farmington River (Segment 2), the water quality criteria for *E. coli*, along with bacteria sampling results for Station 73 in 1998 and 1999 and Station 1761 from 2009-2011, are presented in Table 16. The annual geometric mean was calculated for Station 73 and did not exceed the WQS for *E. coli* in 1999. A geometric mean could not be calculated for sampling year 1998 as there were insufficient data for analysis. Single sample values at this station also did not exceed the WQS for *E. coli* in 1998 and 1999. Geometric mean values exceeded the WQS for *E. coli* at Station 1761 in 2009 and 2011, and single samples values exceeded the WQS for *E. coli* at Station 1761 at least once in all sampling years.

For Munnisunk Brook, the water quality criteria for *E. coli*, along with bacteria sampling results for Station 2445 from 2007-2009, Station 2446 in 2007, and Station 2447 in 2007 are presented in Table 17. The annual geometric mean was calculated for all stations and only Station 2445 exceeded the WQS for *E. coli* in 2007 and 2008. Single sample values exceeded the WQS for *E. coli* multiple times only for Station 2445 in 2007 and 2008. Stations 2446 and 2447 did not exceed the WQS for *E. coli* for single or

geometric mean values. Stations 2246 and 2447 are located upstream of the impaired segment in largely forested areas.

For Owens Brook, the water quality criteria for *E. coli*, along with bacteria sampling results for Station 1637 from 2007-2009, are presented in Table 18. The annual geometric mean was calculated for Station 1637 and exceeded the WQS for *E. coli* for all years. Single sample values at this station also exceeded the WQS for *E. coli* multiple times.

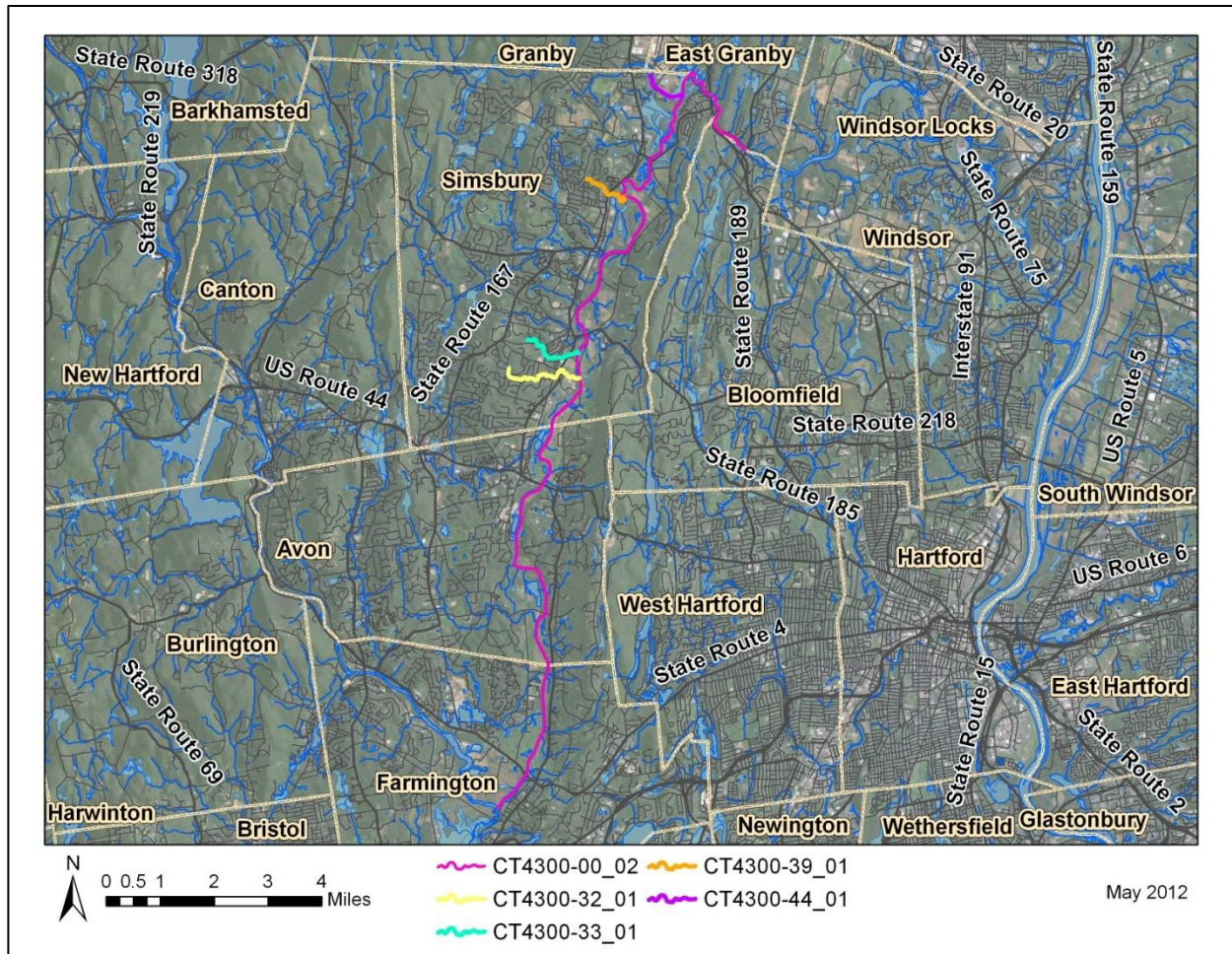
For Russell Brook, the water quality criteria for *E. coli*, along with bacteria sampling results for Station 2449 from 2007-2009, are presented in Table 19. The annual geometric mean was calculated for Station 2449 and exceeded the WQS for *E. coli* for all years. Single sample values at this station also exceeded the WQS for *E. coli* multiple times.

For Minister Brook, the water quality criteria for *E. coli*, along with bacteria sampling results for Station 2448 from 2007-2009, are presented in Table 20. The annual geometric mean was calculated for Station 2448 and exceeded the WQS for *E. coli* in 2008 and 2009. Single sample values at this station also exceeded the WQS for *E. coli* multiple times in 2008 and 2009, but only once in 2007.

To aid in identifying possible bacteria sources, the geometric mean was also calculated for each station for wet-weather and dry-weather sampling days, where appropriate (Tables 16-20). For the Farmington River (Segment 2), only the wet geometric mean at Station 73 exceeded the WQS for *E. coli*. For Munnisunk Brook, both wet and dry geometric mean values at Station 2445 exceeded the WQS for *E. coli*. Stations 2446 and 2447 did not exceed wet or dry geometric mean values at Munnisunk Brook. For Owens Brook, Russell Brook, and Minister Brook, both wet and dry geometric mean values at Stations 1637, 2449, and 2448, respectively, exceeded the WQS for *E. coli*.

Due to the elevated bacteria measurements presented in Tables 16-20, these segments of the Farmington River did not meet CT's bacteria WQS, were identified as impaired, and were placed on the CT List of Waterbodies Not Meeting Water Quality Standards, also known as the CT 303(d) Impaired Waters List. The Clean Water Act requires that all 303(d) listed waters undergo a TMDL assessment that describes the impairments and identifies the measures needed to restore water quality. The goal is for all waterbodies to comply with State WQS.

Figure 5: Aerial map of the Farmington River and its tributaries



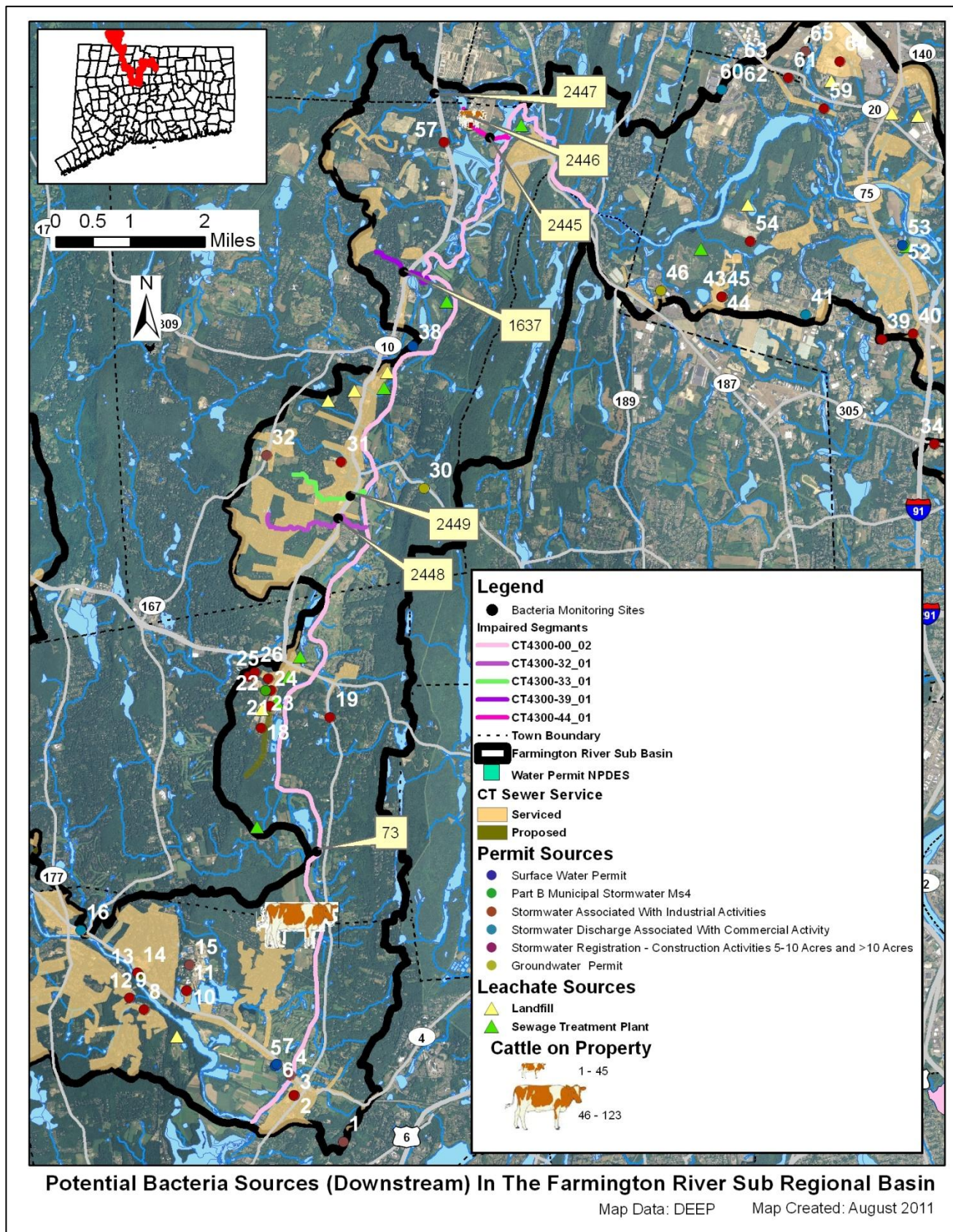
POTENTIAL BACTERIA SOURCES

Potential sources of indicator bacteria in a watershed include point and non-point sources, such as stormwater runoff, agriculture, sanitary sewer overflows (collection system failures), illicit discharges, and inappropriate discharges to the waterbody. Potential sources that have been tentatively identified in the watershed based on land use (Figures 3 and 4) and a collection of local information for the impaired waterbody is presented in Table 3 and Figure 6. However, the list of potential sources is general in nature and should not be considered comprehensive. There may be other sources not listed here that contribute to the observed water quality impairment in the study segments. Further monitoring and investigation will confirm listed sources and discover additional ones. Some segments in this watershed are currently listed as unassessed by CT DEEP procedures. This does not suggest that there are no potential issues on this segment, but indicates a lack of current data to evaluate the segment as part of the assessment process. For some segments, there are data from permitted sources, and CT DEEP recommends that any elevated concentrations found from those permitted sources be addressed through voluntary reduction measures. More detailed evaluation of potential sources is expected to become available as activities are conducted to implement these TMDLs.

Table 3: Potential bacteria sources in the Farmington River watershed

| Impaired Segment | Permit Source | Illicit Discharge | CSO/SSO Issue | Failing Septic System | Agricultural Activity | Stormwater Runoff | Nuisance Wildlife/Pets | Other |
|-------------------------|----------------------|--------------------------|----------------------|------------------------------|------------------------------|--------------------------|-------------------------------|--------------|
| CT4300-00_02 | x | x | | x | x | x | x | x |
| CT4300-44_01 | | | | x | x | x | x | x |
| CT4300-39_01 | x | x | | x | | x | x | |
| CT4300-33_01 | | x | | | x | x | x | |
| CT4300-32_01 | x | x | | | x | x | x | |

Figure 6: Potential sources in the Farmington River (Segment 2 and tributaries) watershed at the sub-regional level



The potential sources map for the impaired basin was developed after thorough analysis of available data sets. If information is not displayed in the map, then no sources were discovered during the analysis. The following is the list of potential sources that were evaluated: problems with migratory waterfowl, golf course locations, reservoirs, proposed and existing sewer service, cattle farms, poultry farms, permitted sources of bacteria loading (surface water discharge, MS4 permit, industrial stormwater, commercial stormwater, groundwater permits, and construction related stormwater), and leachate and discharge sources (agricultural waste, CSOs, failing septic systems, landfills, large septic tank leach fields, septage lagoons, sewage treatment plants, and water treatment or filter backwash).

Point Sources

Permitted sources within the watershed that could potentially contribute to the bacteria loading are identified in Table 4. This table includes permit types that may or may not be present in the impaired watershed. A list of active permits in the watershed is included in Table 5. Additional investigation and monitoring may reveal the presence of additional discharges in the watershed. Available effluent data from each of these permitted categories found within the watershed are compared to the CT State WQS for the appropriate receiving waterbody use and type. When available, bacteria data results from these permitted sources are listed in Table 6.

Table 4: General categories list of other permitted discharges

| Permit Code | Permit Description Type | Number in watershed |
|-------------|--|---------------------|
| CT | Surface Water Discharges | 6 |
| GPL | Discharge of Swimming Pool Wastewater | 0 |
| GSC | Stormwater Discharge Associated with Commercial Activity | 7 |
| GSI | Stormwater Associated with Industrial Activity | 37 |
| GSM | Part B Municipal Stormwater MS4 | 8 |
| GSN | Stormwater Registration – Construction | 6 |
| LF | Groundwater Permit (Landfill) | 0 |
| UI | Underground Injection | 5 |

Other Permitted Sources

As shown in Table 5, there are multiple permitted discharges in the Farmington River watershed. Bacteria data from 2001-2003 for some of these industrial permitted facilities are included in Table 8. Though this data cannot be compared to a water quality standard as Connecticut only has a fecal coliform bacteria WQS for shellfishing uses, samples from outfalls at Wood Group Pratt & Whitney Industrial Turbine Services in Windsor Locks, CT; Combustion Engineering in Windsor, CT; Windsor Stevens in Windsor, CT; Windsor-Bloomfield Landfill in Windsor, CT; Barnes Aerospace in Windsor, CT; Ensign-Bickford Realty Corporation in Simsbury, CT; CT DOT in Simsbury, CT; Technical Coating Laboratory in Avon, CT; Charles W. House & Sons in Farmington, CT; Farmington Ready Mix in Farmington, CT; and Town of New Hartford in New Hartford, CT, all exceeded 1,000 colonies/100mL for fecal coliform on multiple sample dates from 2001 to 2003.

Since the MS4 permits are not targeted to a specific location, but the geographic area of the regulated municipality, there is no one accurate location on the map to display the location of these permits. One dot will be displayed at the geographic center of the municipality as a reference point. Sometimes this location falls outside of the targeted watershed and therefore the MS4 permit will not be displayed in the Potential Sources Map. Using the municipal border as a guideline will show which areas of an affected watershed are covered by an MS4 permit.

Table 5: Permitted facilities within the Farmington River watershed

| Town | Client | Permit ID | Permit Type | Site Name/Address | Map # |
|---------------|---|------------------|--|--------------------------------------|--------------|
| Windsor Locks | Hamilton Sundstrand Corporation | GSI000388 | Stormwater Associated With Industrial Activities | Hamilton Sundstrand | 64 |
| Windsor Locks | Embraer Aircraft Holding Co Inc | GSN001706 | Stormwater Registration - Construction Activities 5-10 Acres | Embraer Executive Jet Services, Inc. | 65 |
| Windsor | The Metropolitan District | CT0100994 | Surface Water Permit | Mdc Poquonock WPCF | 53 |
| Windsor | Unisource World Wide | GSC000349 | Stormwater Discharge Associated With Commercial Activity | Unisource Worldwide, Inc. | 41 |
| Windsor | Tradeport Development I, Llc | GSC000141 | Stormwater Discharge Associated With Commercial Activity | Tradeport Development I, Llc | 62 |
| Windsor | River Bend Associates, Inc | GSC000141 | Stormwater Discharge Associated With Commercial Activity | Tradeport Development I, Llc | 63 |
| Windsor | Bottling Group, Llc | GSC000250 | Stormwater Discharge Associated With Commercial Activity | Pepsi Bottling Group | 60 |
| Windsor | Barnes Group Inc. | GSI001050 | Stormwater Associated With Industrial Activities | Barnes Aerospace Windsor Division | 37 |
| Windsor | Turbotec Products Inc | GSI001866 | Stormwater Associated With Industrial Activities | Turbotec Products, Inc. | 39 |
| Windsor | Town of Windsor | GSI001508 | Stormwater Associated With Industrial Activities | Windsor Public Works Complex | 40 |
| Windsor | Town of Windsor | GSI002118 | Stormwater Associated With Industrial Activities | Town Of Windsor Parks Garage | 33 |
| Windsor | State of Connecticut Department of Transportation | GSI000086 | Stormwater Associated With Industrial Activities | Windsor Maintenance Facility | 34 |
| Windsor | Combustion Engineering, Inc | GSI000694 | Stormwater Associated With Industrial Activities | Abb, Inc. | 45 |
| Windsor | The Metropolitan District | GSI001672 | Stormwater Associated With Industrial Activities | Mdc Poquonock WPCF | 52 |
| Windsor | Town of Windsor | GSI000860 | Stormwater Associated With Industrial Activities | Windsor-Bloomfield Sanitary Landfill | 54 |

Table 5: Permitted facilities within the Farmington River watershed (continued)

| Town | Client | Permit ID | Permit Type | Site Name/Address | Map # |
|-------------|---|------------------|--|--------------------------------------|--------------|
| Windsor | Stanley Black & Decker, Inc | GSI002263 | Stormwater Associated With Industrial Activities | Farmington River Power Company | 59 |
| Windsor | Abb, Inc. | GSN001895 | Stormwater Registration - Construction Activities >10 Acres | Abb, Inc. | 43 |
| Windsor | 10 Gpn Windsor Infinity Llc | UI0000471 | Groundwater Permit | Griffin Center | 46 |
| Windsor | Alstom Power, Inc | UI0000339 | Groundwater Permit | Abb, Inc. | 44 |
| Bloomfield | Town of Bloomfield | GSM000035 | Part B Municipal Stormwater MS4 | Bloomfield, Town of | NA |
| East Granby | State of Connecticut Department of Transportation | GSI000954 | Stormwater Associated With Industrial Activities | Conn Dot East Granby | 61 |
| East Granby | Town of East Granby | GSM000089 | Part B Municipal Stormwater MS4 | East Granby, Town of | NA |
| Simsbury | Town of Simsbury | CT0100919 | Surface Water Permit | Simsbury Sewage Treatment | 38 |
| Simsbury | State of Connecticut Department of Transportation | GSI000060 | Stormwater Associated With Industrial Activities | Simsbury Maintenance Facility | 57 |
| Simsbury | Town of Simsbury | GSI001083 | Stormwater Associated With Industrial Activities | Simsbury Recycling Drop Off Facility | 58 |
| Simsbury | Town of Simsbury | GSM000071 | Part B Municipal Stormwater MS4 | Simsbury, Town of | NA |
| Simsbury | The Ethel Walker School, Incorporated | GSN001813 | Stormwater Registration - Construction Activities 5-10 Acres | Ethel Walker School | 32 |
| Simsbury | Upper Folly Farm Conservancy, Inc. | UI0000091 | Groundwater Permit | Upper Folly Farm | 30 |
| Weatogue | Sand Hill Simsbury, Llc | GSI002302 | Stormwater Associated With Industrial Activities | Sand Hill Simsbury, Llc | 31 |
| Avon | Rotondo Precast, Inc. | GSI000478 | Stormwater Associated With Industrial Activities | Oldcastle Precast, Rotondo Avon Div | 20 |
| Avon | Town of Avon | GSI000630 | Stormwater Associated With Industrial Activities | Avon Landfill | 17 |
| Avon | Dattco, Inc. | GSI002081 | Stormwater Associated With Industrial Activities | Dattco | 18 |
| Avon | Town of Avon | GSI001202 | Stormwater Associated With Industrial Activities | Avon Public Works Facility | 21 |
| Avon | R. R. Donnelley & Sons Company | GSI001562 | Stormwater Associated With Industrial Activities | R. R. Donnelley & Sons Company | 24 |

Table 5: Permitted facilities within the Farmington River watershed (continued)

| Town | Client | Permit ID | Permit Type | Site Name/Address | Map # |
|-------------|---|------------------|---|----------------------------------|--------------|
| Avon | Legere Group, Inc. | GSI001603 | Stormwater Associated With Industrial Activities | Legere Group, Ltd. | 25 |
| Avon | Ofs Fitel, Llc | GSI001520 | Stormwater Associated With Industrial Activities | Ofs Fitel, Llc | 26 |
| Avon | Town of Avon | 200902619 | Part B Municipal Stormwater MS4 | Avon, Town of | NA(22) |
| Avon | Town of Avon | GSM000044 | Part B Municipal Stormwater MS4 | Avon, Town of | NA(23) |
| Avon | Old Stone Crossing, Llc | GSN001704 | Stormwater Registration - Construction Activities >10 Acres | Weatherstone | 27 |
| Avon | Toll Connecticut, L.P. | GSN002245 | Stormwater Registration - Construction Activities >10 Acres | Weatherstone | 28 |
| Avon | State of Connecticut Department of Transportation | GSI000002 | Stormwater Associated With Industrial Activities | Avon Maintenance Facility | 19 |
| Farmington | Town of Farmington | CT0100218 | Surface Water Permit | Farmington Sewage Treatment | 5 |
| Farmington | Town of Farmington | CT0100218 | Surface Water Permit | Farmington WPCF | 7 |
| Farmington | State of Connecticut Department of Transportation | GSI000021 | Stormwater Associated With Industrial Activities | Farmington Salt Storage | 2 |
| Farmington | Town of Farmington | GSI001931 | Stormwater Associated With Industrial Activities | Farmington Sanitary Landfill Ii | 3 |
| Farmington | Town of Farmington | GSI001801 | Stormwater Associated With Industrial Activities | Farmington WPCF | 6 |
| Farmington | Polymer Resources, Ltd. | GSI000661 | Stormwater Associated With Industrial Activities | Polymer Resources, Ltd. | 8 |
| Farmington | Town of Farmington | GSI001254 | Stormwater Associated With Industrial Activities | Farmington Public Works Facility | 9 |
| Farmington | Farmington Ready Mix, Inc. | GSI000540 | Stormwater Associated With Industrial Activities | Farmington Ready Mix, Inc. | 10 |
| Farmington | Dunning Sand & Gravel Company, Inc. | GSI002310 | Stormwater Associated With Industrial Activities | Dunning Sand & Gravel Co Inc | 11 |
| Farmington | Town of Farmington | GSI001524 | Stormwater Associated With Industrial Activities | Salt Storage Shed | 14 |
| Farmington | Town of Farmington | 200903541 | Part B Municipal Stormwater MS4 | Farmington, Town of | NA(12) |
| Farmington | Town of Farmington | GSM000090 | Part B Municipal Stormwater MS4 | Farmington, Town of | NA(13) |
| Farmington | R. Bruce Hunter | GSN002217 | Stormwater Registration - Construction Activities 5- | Hunter's Subdivision | 1 |

| Town | Client | Permit ID | Permit Type | Site Name/Address | Map # |
|------|--------|-----------|-------------|-------------------|-------|
| | | | 10 Acres | | |

Table 5: Permitted facilities within the Farmington River watershed (continued)

| Town | Client | Permit ID | Permit Type | Site Name/Address | Map # |
|--------------|---|-----------|--|---|-------|
| Farmington | State of Connecticut Department of Transportation | GSN001785 | Stormwater Registration - Construction Activities 5-10 Acres | Replacement of Br. #00431 Over Farmington River | 4 |
| Farmington | Meehan Group, Llc | GSN001695 | Stormwater Registration - Construction Activities 5-10 Acres | Tasker's Pond Subdivision | 15 |
| Unionville | The Stop & Shop Supermarket Company Llc | GSC000302 | Stormwater Discharge Associated With Commercial Activity | Unionville Super Stop & Shop #686 | 16 |
| Burlington | Town of Burlington | GSM000049 | Part B Municipal Stormwater MS4 | Burlington, Town of | NA |
| Collinsville | Canton Village Construction Co., Inc. | GSI001908 | Stormwater Associated With Industrial Activities | Canton Village Construction Co., Inc. | 29 |
| New Hartford | Town of New Hartford | CT0100331 | Surface Water Permit | New Hartford WPCF | 35 |
| New Hartford | Town of New Hartford | CT0100331 | Surface Water Permit | New Hartford Sewage Treatment | 36 |
| New Hartford | Inertia Dynamics, Llc | GSI002036 | Stormwater Associated With Industrial Activities | Hitchcock Chair Co Ltd | 47 |
| New Hartford | Town of New Hartford | GSI001324 | Stormwater Associated With Industrial Activities | New Hartford Public Works Facility | 42 |
| New Hartford | Ovation Instruments | GSI000468 | Stormwater Associated With Industrial Activities | Kmc Music, Inc. | 49 |
| New Hartford | Town of New Hartford | GSI002311 | Stormwater Associated With Industrial Activities | New Hartford Sand/Salt Storage Facility | 50 |
| New Hartford | Egi Acquisition Corporation, Zahnradfabrik, Llc | UI0000138 | Groundwater Permit | Executive Greetins, Inc. | 48 |
| New Hartford | Egi Acquisition Corporation, Zahnradfabrik, Llc | UI0000138 | Groundwater Permit | Zahnradfabrik Llc | 51 |
| Barkhamsted | Regional Refuse Disposal District #1 | GSI000205 | Stormwater Associated With Industrial Activities | Regional Refuse Disposal District #1 | 55 |
| Barkhamsted | Town of Barkhamsted | GSI001609 | Stormwater Associated With Industrial Activities | Barkhamsted Highway Garage | 56 |

Table 6: Industrial permits on Farmington River and available fecal coliform data (colonies/100mL). The results cannot be compared to the water quality standard as there is no recreation standard for fecal coliform.

| Town | Location | Permit Number | Receiving Water | Sample Location | Sample Date | Result |
|---------------|---|---------------|------------------|---------------------------------------|-------------|--------|
| Windsor | Wood Group/Pratt & Whitney | GSI1480 | Farmington River | 001 | 09/25/01 | >600 |
| Windsor Locks | Wood Group Pratt & Whitney, Industrial Turbine Services | GSI1480 | Farmington River | W side of paved area rear of property | 10/11/02 | 200 |
| Windsor Locks | Wood Group Pratt & Whitney, Industrial Turbine Services | GSI1480 | Farmington River | W side of paved area rear of property | 07/09/03 | >2000 |
| Windsor Locks | Wood Group Pratt & Whitney, Industrial Turbine Services | GSI1314 | Farmington River | 001-SE corner of parking lot | 10/11/02 | >2000 |
| Windsor Locks | Wood Group Pratt & Whitney, Industrial Turbine Services | GSI1314 | Farmington River | 001-SE corner of parking lot | 07/09/03 | >2000 |
| Windsor Locks | Hamilton Standard | GSI388 | Farmington River | 001A (AQ-1A) | 07/26/01 | 60 |
| Windsor Locks | Hamilton Standard | GSI388 | Farmington River | 002 (AQ-2) | 07/26/01 | 150 |
| Windsor Locks | Hamilton Standard | GSI388 | Farmington River | 003 (AQ-3) | 07/26/01 | 0 |
| Windsor Locks | Hamilton Standard | GSI388 | Farmington River | 004 (AQ-4) | 07/26/01 | 40 |
| Windsor Locks | Hamilton Standard | GSI388 | Farmington River | 006 (AQ-6) | 07/26/01 | 0 |
| Windsor Locks | Hamilton Standard | GSI388 | Farmington River | 009 (AQ-9) | 07/26/01 | 35 |
| Windsor Locks | Hamilton Standard | GSI388 | Farmington River | 013 (AQ-13) | 07/26/01 | 1,120 |
| Windsor | Combustion Engineering | GSI1411 | Farmington River | 001 | 09/21/01 | >600 |
| Windsor | Combustion Engineering | GSI1411 | Farmington River | 001 | 09/26/02 | >2000 |
| Windsor | Combustion Engineering | GSI1411 | Farmington River | 002 | 09/21/01 | >600 |
| Windsor | Combustion Engineering | GSI1411 | Farmington River | 002 | 09/26/02 | 860 |
| Windsor | Combustion Engineering | GSI1411 | Farmington River | 003 | 09/21/01 | >600 |
| Windsor | Combustion Engineering | GSI1411 | Farmington River | 003 | 09/26/02 | >2000 |

Table 6: Industrial permits on Farmington River and available fecal coliform data (colonies/100mL). The results cannot be compared to the water quality standard as there is no recreation standard for fecal coliform. (continued)

| Town | Location | Permit Number | Receiving Water | Sample Location | Sample Date | Result |
|----------|--------------------------------------|---------------|-------------------------------|---------------------------|-------------|--------|
| Windsor | Combustion Engineering | GSI1411 | Farmington River | 001A | 09/21/01 | >600 |
| Windsor | FedEx (BDLRT) Windsor Locks Facility | GSI1445 | Farmington River | CB at NW corner - Dis 001 | 10/16/02 | 10 |
| Windsor | FedEx (BDLRT) Windsor Locks Facility | GSI1445 | Farmington River | CB at NW corner - Dis 001 | 09/19/03 | 260 |
| Windsor | Wood Group/Pratt & Whitney | GSI1480 | Farmington River | 001 | 09/25/01 | >600 |
| Windsor | Windsor Stevens | GSI416 | Farmington River | 003 (Seymour Hollow) | 08/29/02 | 1,900 |
| Windsor | Windsor Stevens | GSI416 | Farmington River | 003 (Seymour Hollow) | 07/22/03 | 1,600 |
| Windsor | Windsor Stevens | GSI416 | Farmington River | 004 (Rainbow) | 08/29/02 | 120 |
| Windsor | Windsor Stevens | GSI416 | Farmington River | 004 (Rainbow) | 07/22/03 | 1,600 |
| Windsor | Windsor-Bloomfield Landfill | GSI860 | Farmington River | DSN 001 | 09/20/01 | 100 |
| Windsor | Windsor-Bloomfield Landfill | GSI860 | Farmington River | DSN 001 | 08/02/02 | >600 |
| Windsor | Windsor-Bloomfield Landfill | GSI860 | Farmington River | DSN 002 | 08/02/02 | >600 |
| Windsor | Barnes Aerospace, Windsor Division | GSI1050 | Tributary to Farmington River | OF 3 | 09/15/02 | >600 |
| Windsor | Barnes Aerospace, Windsor Division | GSI1050 | Tributary to Farmington River | OF 4 | 09/15/02 | >600 |
| Simsbury | Simsbury Hopmeadow Street, LLC | GSI1643 | Farmington River | SW DSN 002 (AEL#03003820) | 05/08/03 | 50 |
| Simsbury | Simsbury Hopmeadow Street, LLC | GSI1643 | Farmington River | SW DSN 004 (AEL#03003822) | 05/08/03 | 550 |
| Simsbury | Simsbury Hopmeadow Street, LLC | GSI1643 | Farmington River | SW DSN 005 (AEL#03003823) | 05/08/03 | 50 |
| Simsbury | Simsbury Hopmeadow Street, LLC | GSI1643 | Farmington River | SW DSN 006 (AEL#03003824) | 05/08/03 | 900 |
| Simsbury | Simsbury Hopmeadow Street, LLC | GSI1643 | Farmington River | SW DSN 007 (AEL#03003825) | 05/08/03 | 50 |
| Simsbury | Simsbury Hopmeadow Street, LLC | GSI1643 | Farmington River | SW DSN 008 (AEL#03003826) | 05/08/03 | 50 |
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN002 | 08/29/01 | 2,000 |

Table 6: Industrial permits on Farmington River and available fecal coliform data (colonies/100mL). The results cannot be compared to the water quality standard as there is no recreation standard for fecal coliform. (continued)

| Town | Location | Permit Number | Receiving Water | Sample Location | Sample Date | Result |
|----------|------------------------------|---------------|------------------|-----------------|-------------|---------|
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN002 | 06/05/02 | >10,000 |
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN004 | 08/29/01 | 100 |
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN004 | 06/05/02 | >10,000 |
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN005 | 08/29/01 | 600 |
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN005 | 06/05/02 | 3,500 |
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN006 | 08/29/01 | 3,200 |
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN006 | 06/05/02 | 6,500 |
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN007 | 09/10/01 | 500 |
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN007 | 06/05/02 | 700 |
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN008 | 08/29/01 | 9,200 |
| Simsbury | Ensign-Bickford Realty Corp. | GSI245 | Farmington River | SW DSN008 | 06/05/02 | 200 |
| Simsbury | CTDOT | GSI60 | Farmington River | 001 | 09/14/01 | 10,000 |
| Simsbury | Town of Simsbury | GSI1083 | Munnisunk Brook | CB at discharge | 12/18/01 | 2,040 |
| Avon | Technical Coating Laboratory | GSI1302 | Farmington Basin | Outfall CB-A | 07/26/01 | >12,000 |
| Avon | Technical Coating Laboratory | GSI1302 | Farmington Basin | Outfall CB-A | 07/23/02 | tntc |
| Avon | Technical Coating Laboratory | GSI1302 | Farmington Basin | Outfall CB-C | 07/26/01 | 4,500 |
| Avon | Technical Coating Laboratory | GSI1302 | Farmington Basin | Outfall CB-C | 07/23/02 | tntc |
| Avon | Rotondo Inc | GSI478 | Farmington River | SP-A | 09/14/01 | 0 |
| Avon | Rotondo Inc | GSI478 | Farmington River | SP-A | 09/26/02 | 15 |
| Avon | Rotondo Inc | GSI478 | Farmington River | SP-B | 09/14/01 | 120 |
| Avon | Rotondo Inc | GSI478 | Farmington River | SP-B | 09/26/02 | 110 |
| Avon | Avon Landfill | GSI630 | Farmington River | Outfall #5 | 12/14/00 | 4 |

Table 6: Industrial permits on Farmington River and available fecal coliform data (colonies/100mL). The results cannot be compared to the water quality standard as there is no recreation standard for fecal coliform. (continued)

| Town | Location | Permit Number | Receiving Water | Sample Location | Sample Date | Result |
|--------------|---------------------------------------|---------------|------------------------------|---|-------------|--------|
| Farmington | Farmington Town Garage | GSI1254 | High Brook/Farmington River | Highway Department | 08/13/01 | 300 |
| Farmington | Farmington Town Garage | GSI1254 | High Brook/Farmington River | Parks Department | 08/13/01 | 65,000 |
| Farmington | Charles W. House & Sons | GSI190 | Farmington River | Discharge 001 | 07/09/02 | >10000 |
| Farmington | Charles W. House & Sons | GSI190 | Farmington River | Discharge 001 | 09/23/02 | 7,200 |
| Farmington | Charles W. House & Sons | GSI190 | Farmington River | Discharge 002 | 07/09/02 | >10000 |
| Farmington | Charles W. House & Sons | GSI190 | Farmington River | Discharge 002 | 09/26/02 | 50 |
| Farmington | Doncasters Inc | GSI243 | Farmington River | 002 | 07/17/01 | 700 |
| Farmington | Doncasters Inc | GSI243 | Farmington River | 003 | 07/17/01 | 10 |
| Farmington | Polymer Resources | GSI661 | Farmington River | DSN 001 | 10/15/01 | >6000 |
| Farmington | Polymer Resources | GSI661 | Farmington River | DSN 001 | 04/10/02 | 10 |
| Farmington | Polymer Resources | GSI661 | Farmington River | DSN 002 | 10/15/01 | 800 |
| Farmington | Polymer Resources | GSI661 | Farmington River | DSN 002 | 04/10/02 | 10 |
| Farmington | Farmington Ready Mix | GSI540 | Trib to Farmington River | Discharge Outlet from sedimentation tank into brook | 09/25/01 | 3,600 |
| Farmington | Farmington Ready Mix | GSI540 | Trib to Farmington River | Discharge Outlet from sedimentation tank into brook | 09/27/02 | 3,800 |
| Canton | Inertia Dynamics | GSI1027 | Farmington River | Outfall #1 | 05/22/01 | 600 |
| New Hartford | Town of New Hartford | GSI1324 | Farmington River | 1 South | 08/28/01 | 3,000 |
| New Hartford | Town of New Hartford | GSI1324 | Farmington River | 2 North | 08/28/01 | 27,000 |
| New Hartford | Kaman Music Corp.-Ovation Instruments | GSI468 | Farmington River | #1 | 09/28/01 | 5,600 |
| New Hartford | Hitchcock Chair Company | GSI885 | Wetlands to Farmington River | 001 | 07/23/02 | tntc |
| New Hartford | Hitchcock Chair Company | GSI885 | Wetlands to Farmington River | 002 | 07/23/02 | 38 |

Table 6: Industrial permits on Farmington River and available fecal coliform data (colonies/100mL). The results cannot be compared to the water quality standard as there is no recreation standard for fecal coliform. (continued)

| Town | Location | Permit Number | Receiving Water | Sample Location | Sample Date | Result |
|-------------|-----------------------------------|---------------|------------------|-----------------|-------------|--------|
| Barkhamsted | Regional Refuse Disposal District | GS1205 | Farmington River | SW-1 | 10/15/01 | 800 |
| Barkhamsted | Regional Refuse Disposal District | GS1205 | Farmington River | SW-1 | 10/15/02 | 150 |
| Barkhamsted | Regional Refuse Disposal District | GS1205 | Farmington River | SW-2 | 10/15/01 | 59 |
| Barkhamsted | Regional Refuse Disposal District | GS1205 | Farmington River | SW-3 | 10/15/01 | 11 |

Municipal Stormwater Permitted Sources

Per the EPA Phase II Stormwater rule all municipal storm sewer systems (MS4s) operators located within US Census Bureau Urbanized Areas (UAs) must be covered under MS4 permits regulated by the appropriate State agency. There is an EPA waiver process that municipalities can apply for to not participate in the MS4 program. In Connecticut, EPA has granted such waivers to 19 municipalities. All participating municipalities within UAs in Connecticut are currently regulated under MS4 permits by CT DEEP staff in the MS4 program.

The US Census Bureau defines a UA as a densely settled area that has a census population of at least 50,000. A UA generally consists of a geographic core of block groups or blocks that exceeds the 50,000 people threshold and has a population density of at least 1,000 people per square mile. The UA will also include adjacent block groups and blocks with at least 500 people per square mile. A UA consists of all or part of one or more incorporated places and/or census designated places, and may include additional territory outside of any place. (67 FR 11663)

For the 2000 Census a new geographic entity was created to supplement the UA blocks of land. This created a block known as an Urban Cluster (UC) and is slightly different than the UA. The definition of a UC is a densely settled area that has a census population of 2,500 to 49,999. A UC generally consists of a geographic core of block groups or blocks that have a population density of at least 1,000 people per square mile, and adjacent block groups and blocks with at least 500 people per square mile. A UC consists of all or part of one or more incorporated places and/or census designated places; such a place(s) together with adjacent territory; or territory outside of any place. The major difference is the total population cap of 49,999 people for a UC compared to >50,000 people for a UA. (67 FR 11663)

While it is possible that CT DEEP will be expanding the reach of the MS4 program to include UC municipalities in the near future they are not currently under the permit. However, the GIS layers used to create the MS4 maps in this Statewide TMDL did include both UA and UC blocks. This factor creates some municipalities that appear to be within an MS4 program that are not currently regulated through an MS4 permit. This oversight can explain a municipality that is at least partially shaded grey in the maps and there are no active MS4 reporting materials or information included in the appropriate appendix. While these areas are not technically in the MS4 permit program, they are still considered urban by the cluster definition above and are likely to contribute similar stormwater discharges to affected waterbodies covered in this TMDL.

As previously noted, EPA can grant a waiver to a municipality to preclude their inclusion in the MS4 permit program. One reason a waiver could be granted is a municipality with a total population less than 1000 people, even if the municipality was located in a UA. There are 19 municipalities in Connecticut that have received waivers, this list is: Andover, Bozrah, Canterbury, Coventry, East Hampton, Franklin, Haddam, Killingworth, Litchfield, Lyme, New Hartford, Plainfield, Preston, Salem, Sherman, Sprague, Stafford, Washington, and Woodstock. There will be no MS4 reporting documents from these towns even if they are displayed in an MS4 area in the maps of this document.

The list of US Census UCs is defined by geographic regions and is named for those regions, not necessarily by following municipal borders. In Connecticut the list of UCs includes blocks in the following Census Bureau regions: Colchester, Danielson, Lake Pocotopaug, Plainfield, Stafford, Storrs, Torrington, Willimantic, Winsted, and the border area with Westerly, RI (67 FR 11663). Any MS4 maps showing these municipalities may show grey areas that are not currently regulated by the CT DEEP MS4 permit program.

The impaired segments of the Farmington River watershed are located within the Towns of Bloomfield, East Granby, Simsbury, Avon, Farmington, and Burlington, CT. The municipalities are largely urbanized, as defined by the U.S. Census Bureau, and are required to comply with the General Permit for the Discharge of Stormwater from Small Municipal Storm Sewer Systems (MS4 permit) issued by the Connecticut Department of Energy and Environmental Protection (DEEP) (Figure 8). This general permit is only applicable to municipalities that are identified in Appendix A of the MS4 permit that contain designated urban areas and discharge stormwater via a separate storm sewer system to surface waters of the State. The permit requires municipalities to develop a Stormwater Management Plan (SMP) to reduce the discharge of pollutants and protect water quality. The MS4 permit is discussed further in the “TMDL Implementation Guidance” section of the core TMDL document. Additional information regarding stormwater management and the MS4 permit can be obtained on CTDEEP’s website (http://www.ct.gov/dep/cwp/view.asp?a=2721&q=325702&depNav_GID=1654).

Multiple MS4 outfalls have been sampled for *E. coli* bacteria in the watershed (Table 7). In Windsor, five MS4 outfalls were sampled in 2004, 2006-2009, and 2011, and four exceeded the single sample water quality standard (WQS) of 410 colonies/100 mL on at least one sample date. In East Granby, three MS4 outfalls were sampled in 2006, and two exceeded the single sample WQS on at least one sample date. In Granby, seven MS4 outfalls were sampled from 2004-2005, and four exceeded the single sample WQS on at least one sample date. In Simsbury, four MS4 outfalls were sampled from 2004-2005 and 2007-2009, and three exceeded the single sample WQS on at least one sample date. In Avon, six MS4 outfalls were sampled from 2004-2009, and all outfalls exceeded the single sample WQS on at least one sample date. In Farmington, seven MS4 outfalls were sampled from 2004-2005 and 2008-2009, and six exceeded the single sample WQS on at least one sample date. In Canton, seven MS4 outfalls were sampled from 2005-2009 and 2011, and all outfalls exceeded the single sample WQS on at least one sample date.

Figure 7: MS4 areas of the Farmington River watershed

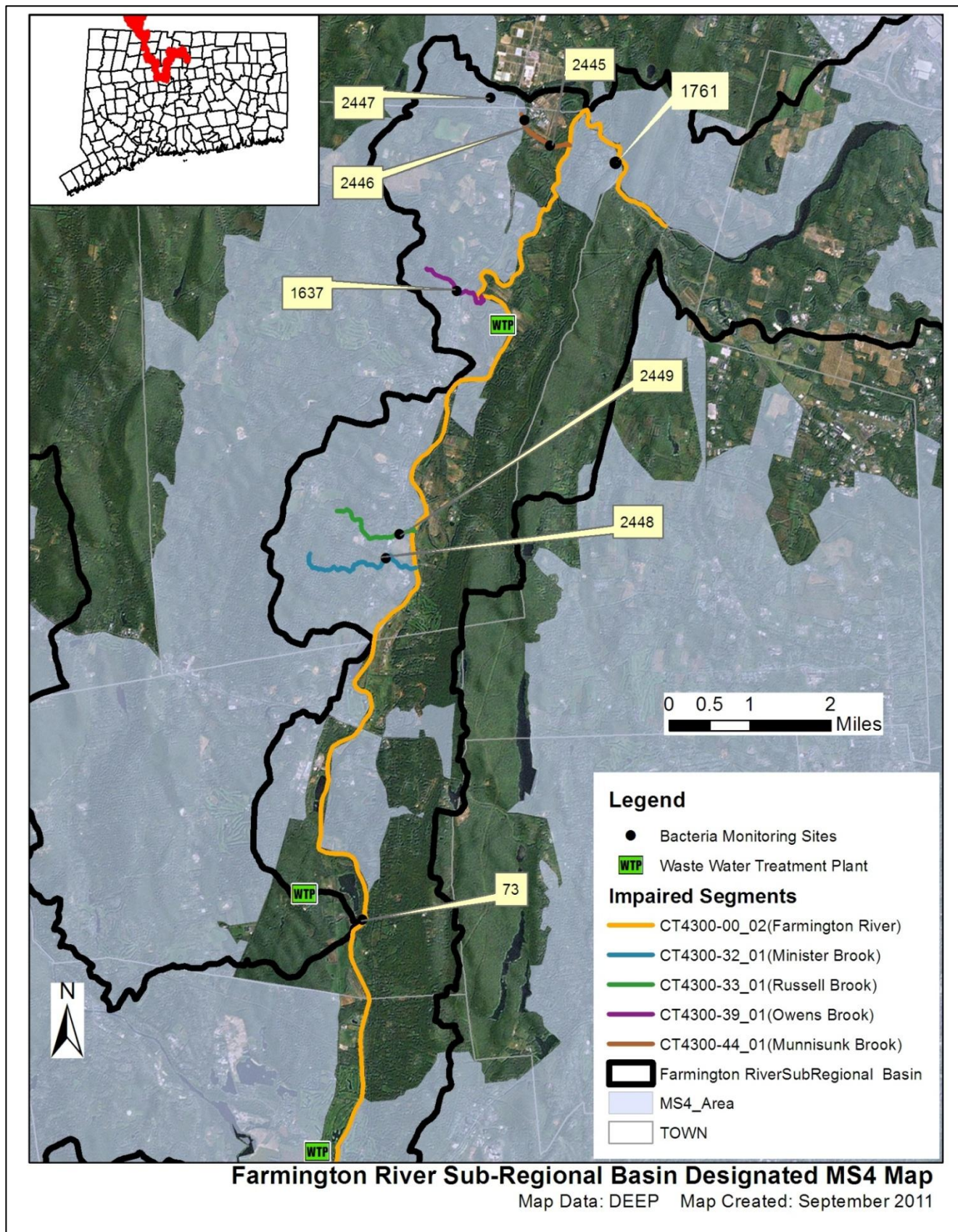


Table 7: List of MS4 sample locations and *E. coli* (colonies/100 mL) results in the Farmington River watershed

| Town | Location | MS4 Type | Receiving Waters | Sample Date | Result |
|-------------|--|-------------|------------------------------------|-------------|--------|
| Windsor | 1075 Kennedy Road #1 | Commercial | Farmington River | 12/01/06 | >2000 |
| Windsor | 1075 Kennedy Road #1 | Commercial | Farmington River | 04/12/07 | 260 |
| Windsor | 1075 Kennedy Road #1 | Commercial | Farmington River | 11/26/07 | 10 |
| Windsor | 1075 Kennedy Road #1 | Commercial | Farmington River | 09/26/08 | 360 |
| Windsor | 1075 Kennedy Road #1 | Commercial | Farmington River | 06/09/09 | 1,230 |
| Windsor | 1075 Kennedy Road #1 | Commercial | Farmington River | 08/25/11 | 5,480 |
| Windsor | 124/128 Harvest Lane #2 | Residential | Farmington River | 12/01/06 | >600 |
| Windsor | 124/128 Harvest Lane #2 | Residential | Farmington River | 04/12/07 | 20 |
| Windsor | 124/128 Harvest Lane #2 | Residential | Farmington River | 11/26/07 | 10 |
| Windsor | 124/128 Harvest Lane #2 | Residential | Farmington River | 09/26/08 | 2,010 |
| Windsor | 124/128 Harvest Lane #2 | Residential | Farmington River | 06/09/09 | 1,920 |
| Windsor | 124/128 Harvest Lane #2 | Residential | Farmington River | 08/25/11 | 3,080 |
| Windsor | A-Bart's on Palisado Avenue | Commercial | Farmington River | 04/12/07 | >1200 |
| Windsor | A-Bart's on Palisado Avenue | Commercial | Farmington River | 11/26/07 | 10 |
| Windsor | A-Bart's on Palisado Avenue | Commercial | Farmington River | 09/26/08 | 960 |
| Windsor | A-Bart's on Palisado Avenue | Commercial | Farmington River | 06/09/09 | 5,480 |
| Windsor | Harvest Lane Residential #1 | Residential | Farmington River (unnamed trib) | 12/01/04 | >600 |
| Windsor | Kennedy Road Commercial #1 | Commercial | Farmington River (unnamed trib) | 12/01/04 | 100 |
| East Granby | 15" RCP to level spreader at S side of Austin Brook Road | Residential | Farmington River | 10/17/06 | 8,200 |
| East Granby | 15" RCP to level spreader at S side of Austin Brook Road | Residential | Farmington River | 10/17/06 | 1,500 |
| East Granby | 24" RCP to basin at Hazelwood Road & CT Drive | Industrial | Farmington River | 10/17/06 | 350 |
| East Granby | 24" RCP to basin at Hazelwood Road & CT Drive | Residential | Farmington River | 10/17/06 | 6,400 |
| East Granby | 24" RCP to basin at Hazelwood Road & CT Drive | Commercial | Farmington River | 10/17/06 | 100 |
| East Granby | 36" RCP to watercourse at Bradley Park Road | Industrial | Farmington River | 10/17/06 | 200 |
| Granby | Bank Street at N entrance to Geissler Supermarket | Commercial | Farmington River Basin | 11/21/04 | 100 |
| Granby | Bank Street at N entrance to Geissler Supermarket | Commercial | Farmington River Basin | 09/15/05 | 50 |

Table 7: List of MS4 sample locations and *E. coli* (colonies/100 mL) results in the Farmington River watershed (continued)

| Town | Location | MS4 Type | Receiving Waters | Sample Date | Result |
|----------|--|--------------------|---|-------------|--------|
| Granby | Buttles Road at E end of intersection | Residential | Farmington River Basin | 09/15/05 | 7,600 |
| Granby | Corner of School Road W of N. Granby Road | Industrial | Farmington River Basin | 09/15/05 | 150 |
| Granby | Floydville Road at first cross culvert on Route 10 | Industrial | Farmington River Basin | 11/21/04 | 1,000 |
| Granby | Floydville Road at first cross culvert on Route 10 | Industrial | Farmington River Basin | 09/15/05 | 50 |
| Granby | Mill Pond Road at cul-de-sac | Commercial | Farmington River Basin | 11/21/04 | 700 |
| Granby | Mill Pond Road at cul-de-sac | Commercial | Farmington River Basin | 09/15/05 | 50 |
| Granby | Spring Glenn at easterly most CB | Residential | Farmington River Basin | 11/21/04 | 3,000 |
| Granby | Spring Glenn at easterly most CB | Residential | Farmington River Basin | 09/15/05 | 1,150 |
| Granby | Buttles Road intersection at first CB | Residential | Farmington River (unnamed trib) | 11/21/04 | 100 |
| Simsbury | Iron Horse Boulevard at Phelps Lane | Commercial /Retail | Farmington River | 02/10/05 | 210 |
| Simsbury | Iron Horse Boulevard at Phelps Lane | Commercial /Retail | Farmington River | 12/29/05 | 210 |
| Simsbury | Iron Horse Boulevard at Phelps Lane | Commercial /Retail | Farmington River | 01/08/07 | 5 |
| Simsbury | Iron Horse Boulevard at Phelps Lane | Commercial /Retail | Farmington River | 11/06/07 | 24 |
| Simsbury | Iron Horse Boulevard at Phelps Lane | Commercial /Retail | Farmington River | 09/26/08 | 80 |
| Simsbury | Iron Horse Boulevard at Phelps Lane | Commercial /Retail | Farmington River | 09/11/09 | 250 |
| Simsbury | Iron Horse Boulevard at Wilcox Street | Commercial /Retail | Farmington River | 02/10/05 | 100 |
| Simsbury | Iron Horse Boulevard at Wilcox Street | Commercial /Retail | Farmington River | 12/29/05 | 10 |
| Simsbury | Iron Horse Boulevard at Wilcox Street | Commercial /Retail | Farmington River | 01/08/07 | 0 |
| Simsbury | Iron Horse Boulevard at Wilcox Street | Commercial /Retail | Farmington River | 11/06/07 | 37 |
| Simsbury | Iron Horse Boulevard at Wilcox Street | Commercial /Retail | Farmington River | 09/26/08 | 0 |
| Simsbury | Iron Horse Boulevard at Wilcox Street | Commercial /Retail | Farmington River | 09/11/09 | 1,200 |
| Simsbury | Powder Forest Drive | Industrial | Trib to Farmington River (unnamed trib) | 02/10/05 | 50 |
| Simsbury | Powder Forest Drive | Industrial | Farmington River (unnamed trib) | 12/29/05 | 30 |
| Simsbury | Powder Forest Drive | Industrial | Farmington River (unnamed trib) | 01/08/07 | 8 |
| Simsbury | Powder Forest Drive | Industrial | Farmington River (unnamed trib) | 11/06/07 | 84 |

Table 7: List of MS4 sample locations and *E. coli* (colonies/100 mL) results in the Farmington River watershed (continued)

| Town | Location | MS4 Type | Receiving Waters | Sample Date | Result |
|-------------|--|-----------------|---------------------------------|--------------------|---------------|
| Simsbury | Powder Forest Drive | Industrial | Farmington River (unnamed trib) | 09/26/08 | 210 |
| Simsbury | Powder Forest Drive | Industrial | Farmington River (unnamed trib) | 09/11/09 | 600 |
| Simsbury | Oxford Court | Residential | Farmington River(Owens Brook) | 02/10/05 | 550 |
| Simsbury | Oxford Court | Residential | Farmington River(Owens Brook) | 12/29/05 | 40 |
| Simsbury | Oxford Court | Residential | Farmington River(Owens Brook) | 01/08/07 | 22 |
| Simsbury | Oxford Court | Residential | Farmington River(Owens Brook) | 11/06/07 | 842 |
| Simsbury | Oxford Court | Residential | Farmington River(Owens Brook) | 09/26/08 | 60 |
| Simsbury | Oxford Court | Residential | Farmington River(Owens Brook) | 09/11/09 | 950 |
| Avon | C1-outfall at Avon Old Farms Inn on Nod Road | Commercial | Farmington River | 10/15/04 | 11,000 |
| Avon | C1-outfall at Avon Old Farms Inn on Nod Road | Commercial | Farmington River | 11/15/05 | 20 |
| Avon | C1-outfall at Avon Old Farms Inn on Nod Road | Commercial | Farmington River | 09/14/06 | 300 |
| Avon | C1-outfall at Avon Old Farms Inn on Nod Road | Commercial | Farmington River | 11/13/07 | 30 |
| Avon | C1-outfall at Avon Old Farms Inn on Nod Road | Commercial | Farmington River | 11/06/08 | 390 |
| Avon | C1-outfall at Avon Old Farms Inn on Nod Road | Commercial | Farmington River | 10/07/09 | 160 |
| Avon | C2-culvert behind Nassau's furniture | Commercial | Farmington River | 10/15/04 | 3,000 |
| Avon | C2-culvert behind Nassau's furniture | Commercial | Farmington River | 11/15/05 | 700 |
| Avon | C2-culvert behind Nassau's furniture | Commercial | Farmington River | 09/14/06 | >1200 |
| Avon | C2-culvert behind Nassau's furniture | Commercial | Farmington River | 11/13/07 | 450 |
| Avon | C2-culvert behind Nassau's furniture | Commercial | Farmington River | 11/06/08 | 3,870 |
| Avon | C2-culvert behind Nassau's furniture | Commercial | Farmington River | 10/07/09 | 1,720 |
| Avon | I1-outfall at back of Rotondo property on Old Farms Road | Industrial | Farmington River | 10/15/04 | 4,400 |
| Avon | I1-outfall at back of Rotondo property on Old Farms Road | Industrial | Farmington River | 11/15/05 | 20 |

Table 7: List of MS4 sample locations and *E. coli* (colonies/100 mL) results in the Farmington River watershed (continued)

| Town | Location | MS4 Type | Receiving Waters | Sample Date | Result |
|------|---|-------------|------------------------------|-------------|--------|
| Avon | I1-outfall at back of Rotondo property on Old Farms Road | Industrial | Farmington River | 09/14/06 | 20 |
| Avon | I1-outfall at back of Rotondo property on Old Farms Road | Industrial | Farmington River | 11/13/07 | 80 |
| Avon | I1-outfall at back of Rotondo property on Old Farms Road | Industrial | Farmington River | 10/07/09 | 1,610 |
| Avon | I2-outfall at Avon Self Storage on Old Farms Road | Industrial | Farmington River | 10/15/04 | 300 |
| Avon | I2-outfall at Avon Self Storage on Old Farms Road | Industrial | Farmington River | 11/15/05 | 440 |
| Avon | I2-outfall at Avon Self Storage on Old Farms Road | Industrial | Farmington River | 09/14/06 | 280 |
| Avon | I2-outfall at Avon Self Storage on Old Farms Road | Industrial | Farmington River | 11/13/07 | 1,000 |
| Avon | I2-outfall at Avon Self Storage on Old Farms Road | Industrial | Farmington River | 11/06/08 | 60 |
| Avon | I2-outfall at Avon Self Storage on Old Farms Road | Industrial | Farmington River | 10/07/09 | 860 |
| Avon | R1-culvert under New Road just W of Buckingham intersection | Residential | W Branch of Farmington River | 10/15/04 | 20 |
| Avon | R1-culvert under New Road just W of Buckingham intersection | Residential | W Branch of Farmington River | 10/15/04 | 300 |
| Avon | R1-culvert under New Road just W of Buckingham intersection | Residential | W Branch of Farmington River | 11/15/05 | 160 |
| Avon | R1-culvert under New Road just W of Buckingham intersection | Residential | W Branch of Farmington River | 09/14/06 | 100 |
| Avon | R1-culvert under New Road just W of Buckingham intersection | Residential | W Branch of Farmington River | 11/13/07 | 180 |
| Avon | R1-culvert under New Road just W of Buckingham intersection | Residential | W Branch of Farmington River | 11/06/08 | 50 |
| Avon | R1-culvert under New Road just W of Buckingham intersection | Residential | W Branch of Farmington River | 10/07/09 | 660 |
| Avon | R2-culvert under New Road between #176 & #192 | Residential | W Branch of Farmington River | 11/15/05 | 100 |
| Avon | R2-culvert under New Road between #176 & #192 | Residential | W Branch of Farmington River | 09/14/06 | >1200 |
| Avon | R2-culvert under New Road between #176 & #192 | Residential | W Branch of Farmington River | 11/13/07 | 1,000 |
| Avon | R2-culvert under New Road between #176 & #192 | Residential | W Branch of Farmington River | 11/06/08 | 20 |

Table 7: List of MS4 sample locations and *E. coli* (colonies/100 mL) results in the Farmington River watershed (continued)

| Town | Location | MS4 Type | Receiving Waters | Sample Date | Result |
|------------|--|-------------|------------------------------|-------------|--------|
| Avon | R2-culvert under New Road between #176 & #192 | Residential | W Branch of Farmington River | 10/07/09 | 750 |
| Farmington | C6 on W side of Brickyard Road S of Eastview Drive | Commercial | Farmington River | 07/07/09 | 41,000 |
| Farmington | R17 on Wildwood Road at the intersection of Brickyard Road | Residential | Farmington River | 07/07/09 | 52,000 |
| Farmington | C3 just SW of the cul-de-sac at S end of Melrose Drive | Commercial | Farmington River | 11/16/05 | 200 |
| Farmington | outfall at #12 Hobart Street | Residential | Farmington River | 08/06/08 | 6,500 |
| Farmington | outfall to lake at Lido Road | Residential | Farmington River | 08/06/08 | 23,000 |
| Farmington | outfall - Lat (41.4442929), Long (72.5147838) | Residential | Farmington River | 11/24/04 | 5,000 |
| Farmington | outfall - Lat (41.4442929), Long (72.5147838) | Residential | Farmington River | 08/06/08 | 4,300 |
| Farmington | outfall at #26 Garden Street | Residential | Farmington River | 08/06/08 | 8,600 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 08/31/05 | >1000 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 05/09/06 | >600 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 09/11/07 | >2,000 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 09/26/08 | 250 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 11/13/08 | 500 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 06/09/09 | 250 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 08/25/11 | 24,200 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 08/25/11 | 9,800 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 08/31/05 | >1000 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 08/31/05 | >1000 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 05/09/06 | >600 |
| Canton | Outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 9/11/07 | >2,000 |

Table 7: List of MS4 sample locations and *E. coli* (colonies/100 mL) results in the Farmington River watershed (continued)

| Town | Location | MS4 Type | Receiving Waters | Sample Date | Result |
|--------|--|-------------|------------------|-------------|--------|
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 09/26/08 | 250 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 11/13/08 | 500 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 06/09/09 | 250 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 08/25/11 | 24,200 |
| Canton | outfall #1 on S corner of Buttonwood Hill & Highway 44 | Residential | Farmington River | 08/25/11 | 9,800 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 08/31/05 | >1000 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 08/31/05 | >1000 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 05/09/06 | >600 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 05/09/06 | 10 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 09/11/07 | >2,000 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 09/11/07 | >2,000 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 09/26/08 | 1,700 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 09/26/08 | 1,100 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 11/13/08 | 6,000 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 11/13/08 | 2,500 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 06/09/09 | 770 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 06/09/09 | 19,860 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 08/25/11 | 90 |
| Canton | outfall #2 on NW side of the town road bridge footing | Residential | Farmington River | 08/25/11 | 13,300 |
| Canton | outfall #3 at N outlet of retention pond on Commerce Drive | Commercial | Farmington River | 06/09/09 | 620 |

Table 7: List of MS4 sample locations and *E. coli* (colonies/100 mL) results in the Farmington River watershed (continued)

| Town | Location | MS4 Type | Receiving Waters | Sample Date | Result |
|--|--|----------------------------|------------------|-------------|--------|
| Canton | outfall #3 at N outlet of retention pond on Commerce Drive | Commercial | Farmington River | 08/25/11 | 110 |
| Canton | outfall #3 on NW side of Highway 179 bridge footing | Commercial/ Residential | Farmington River | 09/11/07 | >2,000 |
| Canton | outfall #3 on NW side of Highway 179 bridge footing | Commercial/ Residential | Farmington River | 09/26/08 | 4,700 |
| Canton | outfall #3 on NW side of Highway 179 bridge footing | Commercial/ Residential | Farmington River | 11/13/08 | 5,000 |
| Canton | outfall #4 at detention pond off W edge of Commerce Way | Commercial/ Residential | Farmington River | 08/31/05 | >1000 |
| Canton | outfall #4 at detention pond off W edge of Commerce Way | Commercial/ Residential | Farmington River | 05/09/06 | >600 |
| Canton | outfall #4 at detention pond off W edge of Commerce Way | Commercial/ Residential | Farmington River | 09/11/07 | >2,000 |
| Canton | outfall #4 at detention pond off W edge of Commerce Way | Commercial/ Residential | Farmington River | 09/26/08 | 2,200 |
| Canton | outfall #4 at detention pond off W edge of Commerce Way | Commercial/ Residential | Farmington River | 11/13/08 | 1,800 |
| Canton | outfall #4 at detention pond off W edge of Commerce Way | Commercial/ Residential | Farmington River | 06/09/09 | 3,450 |
| Canton | outfall #4 at detention pond off W edge of Commerce Way | Commercial/ Residential | Farmington River | 08/25/11 | 24,200 |
| Shaded cells indicate an exceedance of single-sample based water quality criteria (410 colonies/100 mL) | | | | | |

Publicly Owned Treatment Works

As shown in Figure 8, there are six publicly owned treatment works (POTWs), or wastewater treatment plants, in the Farmington River watershed. Only five of the six had available permit limit data as shown in Table 8. The Poquonock Water Pollution Control Facility (CT0100994) in Windsor, CT, discharges directly to the Farmington River downstream of the impaired Farmington River (Segment 2) and exceeded its 7-day geometric mean permit limit once in 2011. The Simsbury Water Pollution Control Facility (CT0100919) discharges directly to the Farmington River (Segment 2) downstream of Owens Brook and did not exceed its permit limits on any date sampled. The Farmington Water Pollution Control Facility (CT0100218) discharges directly to the Farmington River (Segment 2) and did not exceed its permit limits on any date sampled. The Canton Water Pollution Control Facility (CT0100072) discharges directly upstream of a tributary to the Farmington River and exceeded its 7-day geometric mean permit limit once in 2010. The New Hartford Water Pollution Control Facility (CT0100331) discharges upstream of a tributary to the Farmington River and exceeded its 30-day geometric mean permit limit once in 2010 and its 7-day geometric mean permit limit three times in 2010.

Table 8: Wastewater Treatment Plant Fecal Coliform (colonies/100 mL) Data Discharging to the Farmington River

| Town | Permittee | Permit Number | Receiving Water | Date | 30-Day Geometric Mean | 7-Day Geometric Mean |
|----------|----------------|---------------|------------------|------------|-----------------------|----------------------|
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 05/31/2009 | 23 | 35 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 06/30/2009 | 15 | 34 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 07/31/2009 | 7 | 10 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 08/31/2009 | 11 | 13 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 09/30/2009 | 15 | 87 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 05/31/2010 | 0.021 | 0.021 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 06/30/2010 | 0.028 | 0.028 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 07/31/2010 | 31 | 60 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 08/31/2010 | 31 | 60 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 09/30/2010 | 19 | 20 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 05/31/2011 | 73 | 398 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 06/30/2011 | 23 | 501 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 07/31/2011 | 10 | 10 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 08/31/2011 | 10 | 10 |
| Windsor | Poquonock WPCF | CT0100994 | Farmington River | 09/30/2011 | 9 | 13 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 04/30/2009 | 1 | 8 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 05/31/2009 | 1 | 2 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 06/30/2009 | 1 | 1 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 07/31/2009 | 1 | 1 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 08/31/2009 | 2 | 7 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 09/30/2009 | 3 | 22 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 10/31/2009 | 1 | 1 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 04/30/2010 | 5 | 25 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 05/31/2010 | 3 | 12 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 06/30/2010 | 13 | 144 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 07/31/2010 | 2 | 12 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 08/31/2010 | 7 | 27 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 09/30/2010 | 16 | 73 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 10/31/2010 | 3 | 14 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 04/30/2011 | 2 | 4 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 05/31/2011 | 4 | 10 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 06/30/2011 | 2 | 4 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 07/31/2011 | 2 | 3 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 08/31/2011 | 31 | 223 |

Table 8: Wastewater Treatment Plant Fecal Coliform (colonies/100 mL) Data Discharging to the Farmington River (continued)

| Town | Permittee | Permit Number | Receiving Water | Date | 30-Day Geometric Mean | 7-Day Geometric Mean |
|------------|-----------------|---------------|------------------|------------|-----------------------|----------------------|
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 09/30/2011 | 8 | 318 |
| Simsbury | Simsbury WPCF | CT0100919 | Farmington River | 10/31/2011 | 7 | 29 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 04/30/2009 | 18 | 76 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 05/31/2009 | 0.269 | 0.303 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 06/30/2009 | 0.361 | 0.424 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 07/31/2009 | 7 | 15 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 08/31/2009 | 40 | 96 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 09/30/2009 | 8 | 31 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 10/31/2009 | 23 | 33 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 04/30/2010 | 5 | 17 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 05/31/2010 | 3 | 4 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 06/30/2010 | 9 | 18 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 07/31/2010 | 8 | 22 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 08/31/2010 | 14 | 36 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 09/30/2010 | 51 | 103 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 10/31/2010 | 8 | 13 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 04/30/2011 | 17 | 94 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 05/31/2011 | 2 | 3 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 06/30/2011 | 2 | 14 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 07/31/2011 | 3 | 8 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 08/31/2011 | 25 | 129 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 10/31/2011 | 14 | 213 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 04/30/2009 | 1 | 1 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 05/31/2009 | 1 | 1 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 06/30/2009 | 1 | 1 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 07/31/2009 | 1 | 1 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 08/31/2009 | 1 | 1 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 09/30/2009 | 3 | 8 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 10/31/2009 | 18 | 130 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 04/30/2010 | 24 | 211 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 05/31/2010 | 3 | 4 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 06/30/2010 | 9 | 18 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 07/31/2010 | 8 | 22 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 08/31/2010 | 14 | 36 |

Table 8: Wastewater Treatment Plant Fecal Coliform (colonies/100 mL) Data Discharging to the Farmington River (continued)

| Town | Permittee | Permit Number | Receiving Water | Date | 30-Day Geometric Mean | 7-Day Geometric Mean |
|--------------|-------------------|---------------|------------------|------------|-----------------------|----------------------|
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 09/30/2010 | 51 | 103 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 10/31/2010 | 8 | 13 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 04/30/2011 | 17 | 94 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 05/31/2011 | 2 | 3 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 06/30/2011 | 2 | 14 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 07/31/2011 | 3 | 8 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 08/31/2011 | 25 | 129 |
| Farmington | Farmington WPCF | CT0100218 | Farmington River | 10/31/2011 | 14 | 213 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 04/30/2009 | 1 | 1 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 05/31/2009 | 1 | 1 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 06/30/2009 | 1 | 1 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 07/31/2009 | 1 | 1 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 08/31/2009 | 1 | 1 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 09/30/2009 | 3 | 8 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 10/31/2009 | 18 | 130 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 04/30/2010 | 24 | 211 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 05/31/2010 | 2 | 7 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 06/30/2010 | 21 | 930 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 07/31/2010 | 2 | 6 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 08/31/2010 | 4 | 40 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 09/30/2010 | 4 | 14 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 10/31/2010 | 4 | 22 |
| Canton | Canton WPCF | CT0100072 | Farmington River | 04/30/2011 | 1 | 2 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 04/30/2009 | 28 | 190 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 05/31/2009 | 17 | 48 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 06/30/2009 | 44 | 110 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 07/31/2009 | 100 | 350 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 08/31/2009 | 25 | 100 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 09/30/2009 | 25 | 80 |

Table 8: Wastewater Treatment Plant Fecal Coliform (colonies/100 mL) Data Discharging to the Farmington River (continued)

| Town | Permittee | Permit Number | Receiving Water | Date | 30-Day Geometric Mean | 7-Day Geometric Mean |
|---|-------------------|---------------|------------------|------------|-----------------------|----------------------|
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 10/31/2009 | 49 | 190 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 04/30/2010 | 332 | 1500 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 05/31/2010 | 156 | 780 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 06/30/2010 | 16 | 60 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 07/31/2010 | 12 | 110 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 08/31/2010 | 10 | 10 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 09/30/2010 | 23 | 600 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 10/31/2010 | 10 | 10 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 06/30/2011 | 20 | 60 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 07/31/2011 | 17 | 90 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 08/31/2011 | 10 | 10 |
| New Hartford | New Hartford WPCF | CT0100331 | Farmington River | 09/30/2011 | 40 | 140 |
| 30-Day Geometric Mean Permit Limit = 200 colonies/100 mL | | | | | | |
| 7-Day Geometric Mean Permit Limit = 400 colonies/100 mL | | | | | | |
| Shaded cells indicate an exceedance of permit limits | | | | | | |

Non-point Sources

Non-point source pollution (NPS) comes from many diffuse sources and is more difficult to identify and control. NPS pollution is often associated with land-use practices. Examples of NPS that can contribute bacteria to surface waters include insufficient septic systems, pet and wildlife waste, agriculture, and contact recreation (swimming or wading). Potential sources of NPS within the Farmington River watershed are described below.

Agricultural Activities

Agricultural operations are an important economic activity and landscape feature in many areas of the State. Agricultural land use makes up 9% of the Farmington River watershed. There are several hayfields, row crops, cattle farms, and horse farms located along the Farmington River, especially the

Farmington River (Segment 2) and Munnisunk Brook. A large equestrian center, the Farmington Polo Grounds, is located along the Farmington River (Segment 2) in Farmington. As shown in Figure 6, a cattle farm along the Farmington River (Segment 2) in Farmington has roughly 46-123 cattle. Another cattle farm along Munnisunk Brook in Simsbury has roughly 1-45 cattle on site. A portion of Munnisunk Brook also runs through a cleared hayfield that has been mowed right to the river banks. Station 2445 on Munnisunk Brook exceeded both wet and dry geometric mean limits, making the cattle farm a potential upstream source of bacterial contamination. Runoff from agricultural fields may contain pollutants such as bacteria and nutrients (USEPA, 2011a). This runoff can include pollutants from farm practices such as storing manure, allowing livestock to wade in nearby waterbodies, applying fertilizer, and reducing the width of vegetated buffer along the shoreline.

Stormwater Runoff from Developed Areas

The majority of the Farmington River watershed is forested, but the impaired segments flow along and cross the highly developed Route 10 (US 202). Approximately 26% of the land use in the watershed is considered urban, and several of the impaired segments, especially the Farmington River (Segment 2), Minister Brook, and Owens Brook, are located within commercial and residential urban areas (Figures 4 and 10). Stormwater pollution sources include fertilizer runoff, leaky septic systems, horse farms, golf courses, and impervious surfaces. Urban areas are often characterized by impervious cover, or surface areas such as roofs and roads that force water to run off land surfaces rather than infiltrate into the soil. Studies have shown a link between increasing impervious cover and degrading water quality conditions in a watershed (CWP, 2003). In one study, researchers correlated the amount of fecal coliform to the percent of impervious cover in a watershed (Mallin *et al.*, 2000).

As shown in Figure 9, approximately 8% of the Farmington River watershed contains more than 12% impervious cover, particularly in the area around Owens Brook (Figure 10). Although Figure 10 reveals a fairly undeveloped watershed, the impervious cover was calculated as sub-basin averages, which masks the dense urban development along Route 10 (US 202) parallel to the Farmington River (Segment 2) and its tributaries, especially Minister Brook, Owens Brook, and Russell Brook. Minister Brook flows through a developed area with a large commercial building known as The Hartford, while Owens Brook and Russell Brook also flow through an urbanized area. Water quality data taken at all stations, except Stations 2446 and 2447, exceeded wet weather geometric mean values, which suggests that stormwater runoff may be a source of bacteria to the Farmington River (Tables 16-20).

Figure 8: Range of impervious cover (%) in the Farmington River watershed

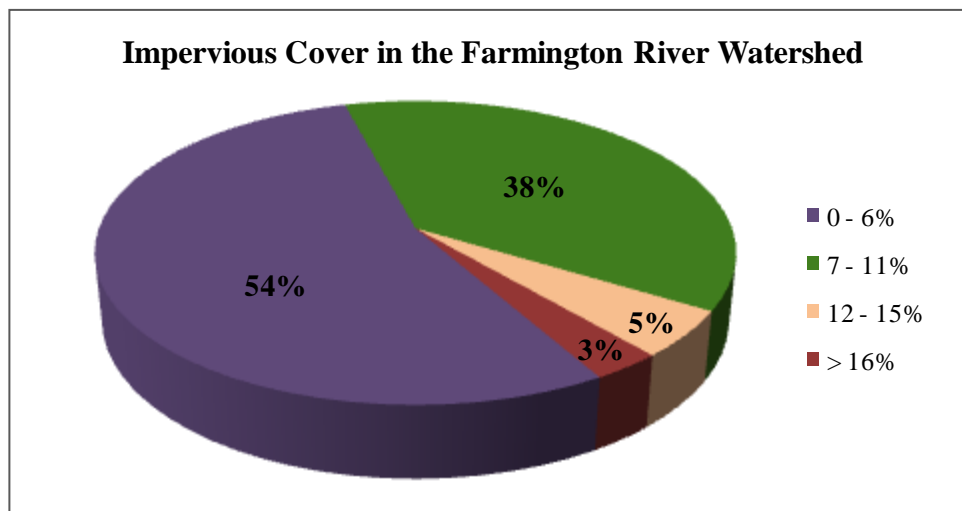
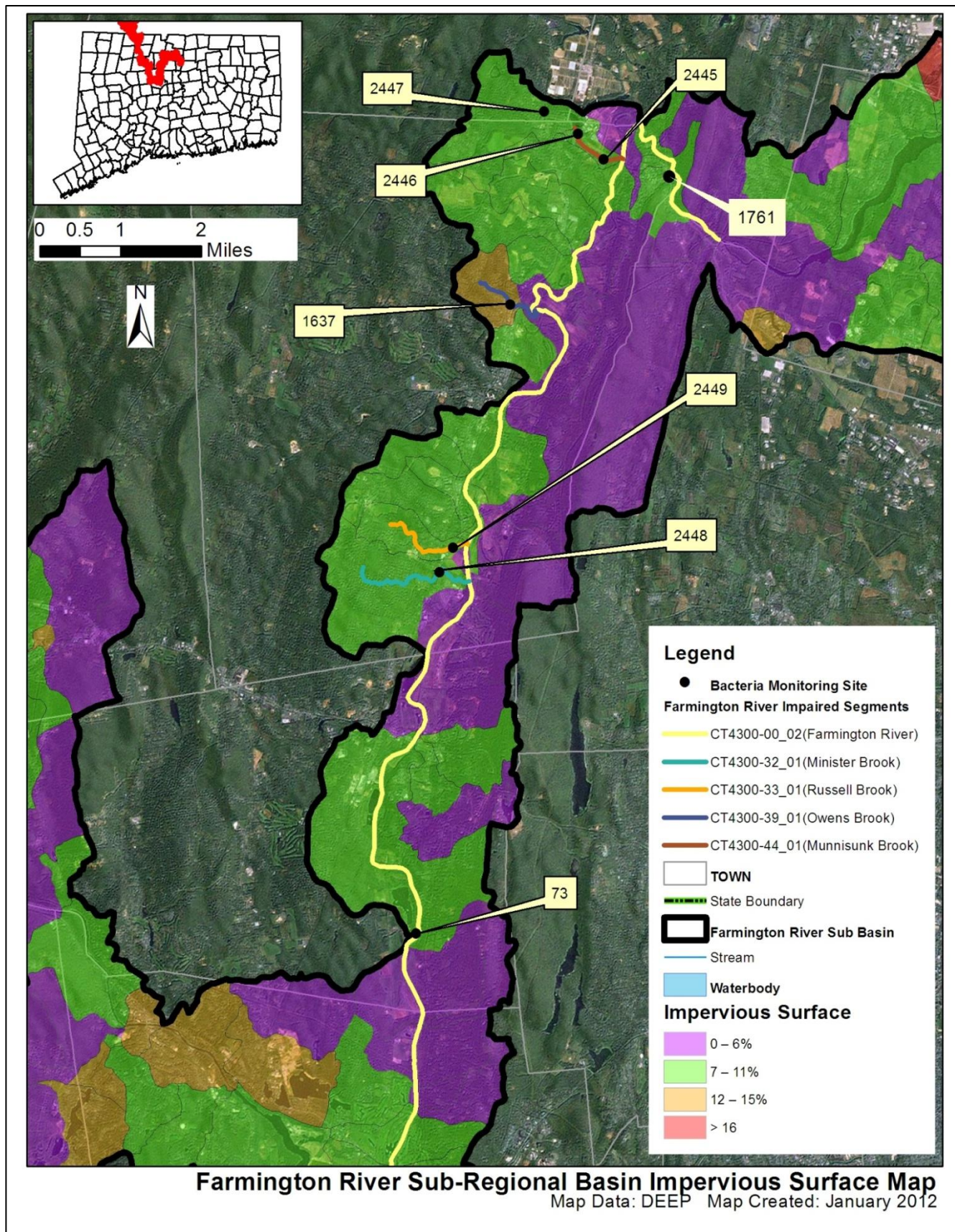


Figure 9: Impervious cover (%) for the Farmington River sub-regional watershed



Wildlife and Domestic Animal Waste

Wildlife and domestic animals within the Farmington River watershed represent another potential source of bacteria. With the construction of roads and drainage systems, these wastes may no longer be retained on the landscape, but instead may be conveyed via stormwater to the nearest surface water. These physical land alterations can exacerbate the impact of natural sources on water quality (USEPA, 2001). Much of the watershed is undeveloped and wildlife waste may be a potential source of bacteria to the Farmington River, but residential development, particularly adjacent to the impaired segments, may indicate pet waste is a more direct potential source of bacteria.

The Farmington Country Club golf course, Blue Fox Run golf course, Tower Ride Country Club, and Hop Meadow Country Club golf course are located adjacent to the Farmington River (Segment 2). Geese and other waterfowl are known to congregate in open areas including recreational fields, agricultural crop fields, and golf courses. In addition to creating a nuisance, large numbers of geese can also create unsanitary conditions on the grassed areas and cause water quality problems due to bacterial contamination associated with their droppings. Large populations of geese can also lead to habitat destruction as a result of overgrazing on wetland and riparian plants.

Insufficient Septic Systems and Illicit Discharges

As shown in Figure 6, the majority of the Farmington River watershed relies on onsite wastewater treatment systems, such as septic systems. Munnisunk Brook and Owens Brook both exceeded geometric mean during dry-weather, which may indicate nearby failing septic systems. Insufficient or failing septic systems can be significant sources of bacteria by allowing raw waste to reach surface waters. In Connecticut, local health directors or health districts are responsible for keeping track of any reported insufficient or failing septic systems in a specific municipality. The Towns of East Granby, Simsbury, Avon, Farmington, Canton, New Hartford, Barkhamsted, Granby, Hartland, and Colebrook are part of the Farmington Valley Health District (<http://www.fvhd.org/>). The Towns of Bloomfield and West Hartford are part of the West Hartford-Bloomfield Health District (<http://www.westhartford.org/whcares/TownDepartments/HealthDistrict/Health1.htm>). The Town of Windsor has a full-time health director (<http://www.townofwindsorct.com/Health/>). The Town of Windsor Locks is part of the North Central Health District (<http://www.ncdhd.org/>).

Most of the area surrounding the Farmington River (Segment 2), Minister Brook, and Russell Brook are serviced by the municipal sewer system (Figure 6). Russell Brook and Minister Brook both exceeded geometric mean during dry-weather, which may indicate nearby failing sewer systems. Sewer system leaks and other illicit discharges or connections can contribute bacteria to nearby surface waters. As shown in Figure 6, there are also several potential leachate sources, including sewage treatment plants along the Farmington River (Segment 2).

Additional Sources

Samples from outfalls along the Farmington River and its tributaries at Wood Group Pratt & Whitney Industrial Turbine Services in Windsor Locks, CT; Combustion Engineering in Windsor, CT; Windsor Stevens in Windsor, CT; Windsor-Bloomfield Landfill in Windsor, CT; Barnes Aerospace in Windsor, CT; Ensign-Bickford Realty Corporation in Simsbury, CT; CT DOT in Simsbury, CT; Technical Coating Laboratory in Avon, CT; Charles W. House & Sons in Farmington, CT; Farmington Ready Mix in Farmington, CT; and Town of New Hartford all exceeded 1,000 colonies/100mL for fecal coliform on multiple sample dates from 2001 to 2003. These results suggest that these outfalls are contributors of bacteria to the impaired segments in the Farmington River watershed.

As shown in Figure 6, there are several landfills located directly adjacent to or near the Farmington River (Segment 2). In particular, the Windsor-Bloomfield landfill in Windsor had fecal coliform counts greater than 600 colonies/100mL at two outfall sampling locations (Table 8).

There may be other sources not listed here or identified in Figure 6 that contribute to the observed water quality impairment in the Farmington River. Further monitoring and investigation will confirm the listed sources and discover additional ones. More detailed evaluation of potential sources is expected to become available as activities are conducted to implement this TMDL.

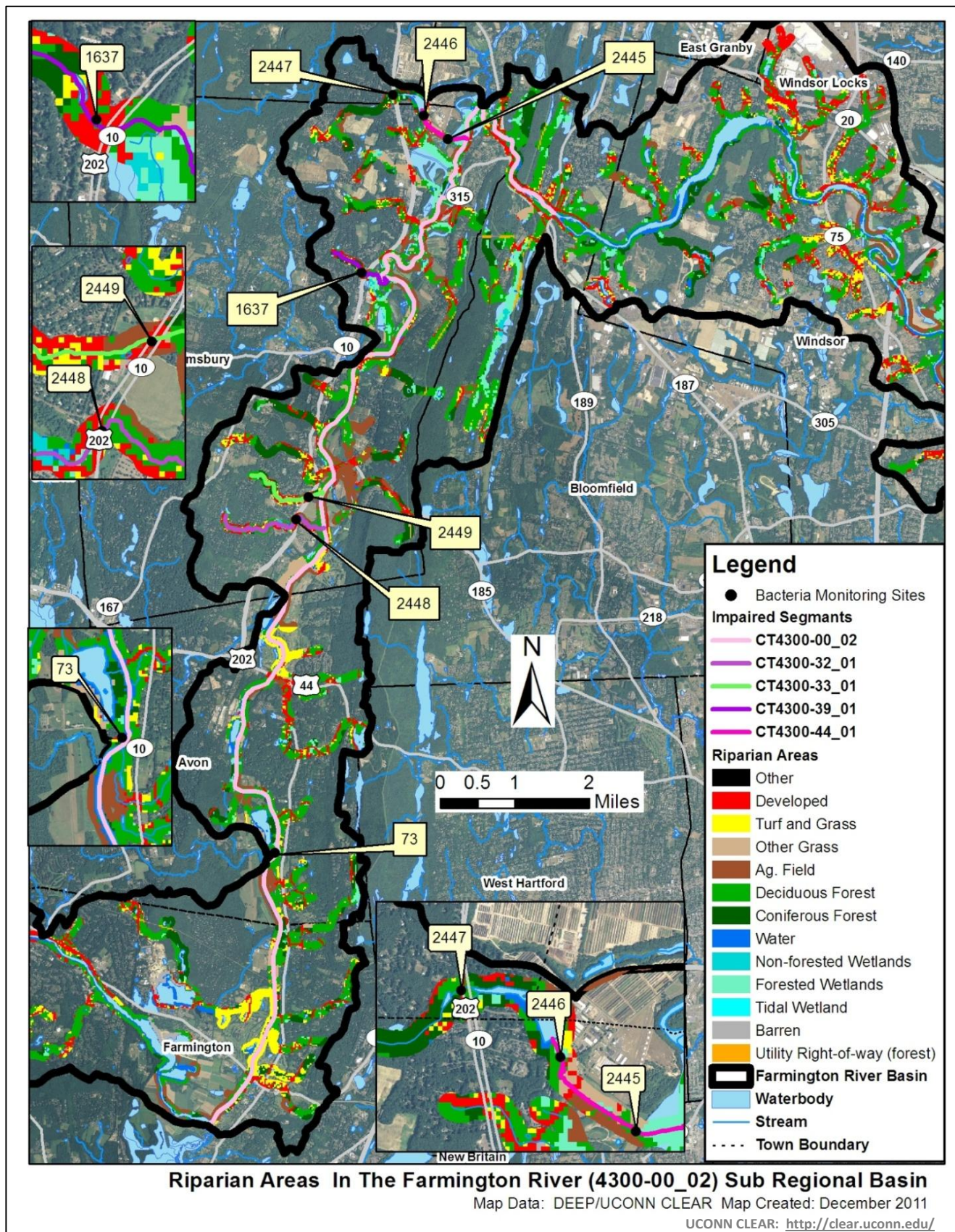
Land Use/Landscape

Riparian Buffer Zones

The riparian buffer zone is the area of land located immediately adjacent to streams, lakes, or other surface waters. The boundary of the riparian zone and the adjoining uplands is gradual and not always well-defined. However, riparian zones differ from uplands because of high levels of soil moisture, frequent flooding, and the unique assemblage of plant and animal communities found there. Through the interaction of their unique soils, hydrology, and vegetation, natural riparian areas influence water quality as contaminants are taken up into plant tissues, adsorbed onto soil particles, or modified by soil organisms. Any change to the natural riparian buffer zone can reduce the effectiveness of the natural buffer and has the potential to contribute to water quality impairment (USEPA, 2011b).

The CLEAR program at UCONN has created streamside buffer layers for the entire State of Connecticut (<http://clear.uconn.edu/>), which have been used in this TMDL. Analyzing this information can reveal potential sources and implementation opportunities at a localized level. The land use directly adjacent to a waterbody can have direct impacts on water quality from surface runoff sources.

The majority of the riparian zone for the Farmington River (Segment 2) is characterized by developed and agricultural land use with large tracts of turf/grass and forest (Figure 11). Riparian areas along Munnisunk Brook are primarily forest and agricultural land (Figure 12). Riparian areas along Owens Brook and Russell Brook are characterized by urban development with some agriculture, forest, and turf/grass areas (Figure 11). Minister Brook riparian area is largely mixed forest with agricultural fields (Figure 11). As previously noted, if not properly treated, runoff from developed areas may contain pollutants such as bacteria and nutrients.

Figure 10: Riparian buffer zone information for the Farmington River (Segment 2 and tributaries) watershed

CURRENT MANAGEMENT ACTIVITIES

The Towns of Avon, Barkhamsted, Bloomfield, Bristol, Burlington, Canton, Colebrook, East Granby, Farmington, Granby, Hartland, Harwinton, New Hartford, Norfolk, Plainville, Plymouth, Simsbury, Suffield, Torrington, West Hartford, Winchester/Winsted, Windsor, and Windsor Locks have developed and implemented programs to protect water quality from bacterial contamination through the Farmington River Watershed Association (<http://www.frwa.org/index.html>).

As indicated previously, Bloomfield, East Granby, Simsbury, Avon, Farmington, and Burlington are regulated under the MS4 program. The MS4 General Permit is required for any municipality with urbanized areas that initiates, creates, originates or maintains any discharge of stormwater from a storm sewer system to waters of the State. The MS4 permit requires towns to design a Stormwater Management Plan (SMP) to reduce the discharge of pollutants in stormwater to improve water quality. The plan must address the following 6 minimum measures:

1. Public Education and Outreach.
2. Public Involvement/Participation.
3. Illicit discharge detection and elimination.
4. Construction site stormwater runoff control.
5. Post-construction stormwater management in new development and redevelopment.
6. Pollution prevention/good housekeeping for municipal operations.

Each town is also required to submit an annual update outlining the steps they are taking to meet the six minimum measures. All updates that address bacterial contamination in the watershed are summarized in Tables 9, 10, 11, 12, 13, and 14.

Table 9: Summary of MS4 requirement updates related to the reduction of bacterial contamination from Bloomfield, CT (Permit #GSM000035)

| Minimum Measure | Bloomfield Annual Report (2006) |
|---|--|
| Public Outreach and Education | 1) Posted EPA brochure <i>After the Storm, A Citizen's Guide to Understanding Stormwater</i> to web page. 6th grade students handed out brochures to homeowners explaining their storm drain stenciling project in the Kenwood Circle neighborhood. 2) Sponsored HazWaste Collection Day twice in 2006. |
| Public Involvement and Participation | 1) Held open meetings with the Stormwater Committee. |
| Illicit Discharge Detection and Elimination | 1) Completed inspection and mapping of all town outfalls greater than 12 inches. 2) Conducted wet weather sampling and analysis at six outfalls. |
| Construction Site Stormwater Runoff Control | 1) Will perform inspections of all construction sites at least once per month, and also after heavy rains, and will perform follow-up inspections to ensure that problems are resolved promptly. |

Table 9: Summary of MS4 requirement updates related to the reduction of bacterial contamination from Bloomfield, CT (Permit #GSM000035) (continued)

| Minimum Measure | Bloomfield Annual Report (2006) |
|--|--|
| Post Construction Stormwater Management | 1) Reviewed land use permit applications for post-construction stormwater quality BMPs for all major town projects. |
| Pollution Prevention and Good Housekeeping | 1) Continued to sweep all streets at least once per year and identify areas that may require sweeping more than once per year. 2) Cleaned 800 catch basins in 2005 and 2006 or roughly 50% of the estimated total number of catch basins in town. |

Table 10: Summary of MS4 requirement updates related to the reduction of bacterial contamination from East Granby, CT (Permit #GSM000089)

| Minimum Measure | East Granby Annual Report (2008) |
|---|---|
| Public Outreach and Education | 1) Held a Land Use Municipal Training Workshop regarding the role of local land use commissions, the use of maps and site plan reviews, and the development of a community resource inventory. 2) Sent out street sweeping notice to all town addresses to remind residents not to sweep grass clippings into the roadway. 3) Storm drain stenciling completed. 4) Participated in MDC's Household Hazardous Waste Collection Day. |
| Public Involvement and Participation | 1) Will develop a public involvement and participation program 2) Will sponsor clean-ups days for rivers and beaches |
| Illicit Discharge Detection and Elimination | 1) Amended Zoning Flood Plain Regulations as part of Stormwater Ordinance. 2) Will continue detection and elimination efforts. 3) Will develop a sewer system map. |
| Construction Site Stormwater Runoff Control | 1) Began inspection program for construction activities, and updated ordinance/regulatory mechanism. |
| Post Construction Stormwater Management | 1) Will identify BMPs for water quality improvement. 2) Will reduce impervious areas. |
| Pollution Prevention and Good Housekeeping | 1) Conducts annual street sweeping and catch basin cleaning. 2) Eliminated use of sand for treating town roadways and public building parking lots in favor of salt/brine solution. |

Table 11: Summary of MS4 requirement updates related to the reduction of bacterial contamination from Simsbury, CT (Permit #GSM000071)

| Minimum Measure | Simsbury Annual Report (2010) |
|---|---|
| Public Outreach and Education | No updates provided. |
| Public Involvement and Participation | No updates provided. |
| Illicit Discharge Detection and Elimination | 1) Checked all drainage outfalls for discharge issues, type of outfall construction, and condition of structures and pipes. 2) Identified cases of seepage from nearby sub-surface septic systems and referred to Farmington Valley Health District for repair or connection to sanitary sewer system. |
| Construction Site Stormwater Runoff Control | 1) Administered Erosion and Sedimentation Control Ordinance for 2 development projects. |
| Post Construction Stormwater Management | No updates provided. |
| Pollution Prevention and Good Housekeeping | 1) Used new treated salt mixture for road snow and ice control system, which eliminated sand deposition to drainage system. 2) Continued catch basin cleaning program of critical basins that directly discharge to waterbodies or infiltration structures. 3) Continued street sweeping program of 324 lane miles. |

Table 12: Summary of MS4 requirement updates related to the reduction of bacterial contamination from Avon, CT (Permit #GSM000044)

| Minimum Measure | Avon Annual Report (2011) |
|---|--|
| Public Outreach and Education | 1) Reviewed LID initiatives to minimize the effects of stormwater. 2) Will include Stormwater MS4 information on DPW web page. 3) Working to get Farmington River designated as a National Wild and Scenic River. Provided link on Town website. |
| Public Involvement and Participation | 1) Developed a community clean-up program. 2) Purchased 34 rain barrels and distributed to residents. |
| Illicit Discharge Detection and Elimination | 1) Will develop illicit discharge detection regulations as part of ordinance. 2) Promoted household hazardous waste collection and recycling. 3) Conducted dry weather screening of outfalls during GIS mapping of Town's infrastructure. 4) Will complete GIS mapping of all structures greater than 6 inches in Town's drainage system. |
| Construction Site Stormwater Runoff Control | 1) Annual inspections of construction sites determined the overall compliance rate being achieved by construction operators. 2) Received DEP grant to draft regulations that incorporate LID. |

Table 12: Summary of MS4 requirement updates related to the reduction of bacterial contamination from Avon, CT (Permit #GSM000044) (continued)

| Minimum Measure | Avon Annual Report (2011) |
|--|--|
| Post Construction Stormwater Management | 1) Conducted inspection and maintenance of retention basins and structures. |
| Pollution Prevention and Good Housekeeping | 1) Conducted annual catch basin inspection and cleaning. 2) Conducted annual street sweeping of over 100 miles of roads and parking lots. |

Table 13: Summary of MS4 requirement updates related to the reduction of bacterial contamination from Farmington, CT (Permit #GSM000090)

| Minimum Measure | Farmington Annual Report (2010) |
|---|---|
| Public Outreach and Education | 1) Published bi-annual newsletter, <i>Farmington Town Letter</i> , for all town notifications and useful information on Hazardous Waste Collection Days, new single stream recycling program, etc. 2) Created a Green Efforts Committee to develop a "green" newsletter and webpage on stormwater, recycling, wetland protection, and natural resources. |
| Public Involvement and Participation | 1) Sponsored Annual Farmington Town-Wide Clean-Up Day and Farmington River Clean-up. 2) Conducted stormwater education seminars in conjunction with school science programs. |
| Illicit Discharge Detection and Elimination | 1) Continued mapping of municipal storm sewer outfalls with goal to map all public, institutional and private storm sewers and outfalls. 2) Completed mapping of outfalls greater than 12 inches in urban areas. 3) Currently reviewing adoption of an illicit discharge ordinance. |
| Construction Site Stormwater Runoff Control | 1) Enforcement of the submission and approval of an erosion and sediment control plan of all disturbed land greater than one half acre and even all construction activity less than one half acre. |
| Post Construction Stormwater Management | 1) Developed a "Declaration of Covenants for Maintenance of Storm and Surface Water Facility", requiring owners to maintain a stormwater management system as approved by the Town. 2) Will develop an inventory of privately owned storm sewers. |
| Pollution Prevention and Good Housekeeping | 1) Eliminated use of sand during winter snow plowing efforts. Currently uses pre and post treatment of salt product. 2) Continue to conduct street sweeping program. 3) Evaluate and clean stormwater structures. |

Table 14: Summary of MS4 requirement updates related to the reduction of bacterial contamination from Burlington, CT (Permit #GSM000049)

| Minimum Measure | Burlington MS4 General Permit (2010) |
|---|---|
| Public Outreach and Education | 1) Will include information about stormwater runoff in future newsletters. |
| Public Involvement and Participation | No updates. |
| Illicit Discharge Detection and Elimination | 1) Will map all outfalls greater than 15" as funds and personnel become available. 2) Will develop an ordinance to prevent illicit discharges to its storm drainage systems. |
| Construction Site Stormwater Runoff Control | 1) MS4 permit requirements and E&S Guidelines implemented on new construction projects. |
| Post Construction Stormwater Management | 1) Developed program to fund the long-term maintenance of existing detention ponds and BMPs with annual inspections. |
| Pollution Prevention and Good Housekeeping | 1) Conducted annual street sweeping and catch basin cleaning program. 2) Reduced the use of sand on roads during winter. |

RECOMMENDED NEXT STEPS

The Towns of Bloomfield, East Granby, Simsbury, Avon, Farmington, and Burlington have developed and implemented programs to protect water quality from bacterial contamination. Future mitigative activities are necessary to ensure the long-term protection of the Farmington River and its tributaries and have been prioritized below. Some of these actions are provided in more detail at the Farmington River Watershed Association website (<http://www.frwa.org/>).

1) Continue monitoring of permitted sources.

Previous sampling of discharges from several permitted sources has shown elevated levels of fecal coliform bacteria, an indicator of bacterial pollution (Table 8). Multiple sewage treatment plants and water treatment plants along the Farmington River (Segment 2) were identified in Figure 6 as potential leachate sources within the watershed. CT DOT Maintenance Facility (GSI000060) in Simsbury, CT, and the Town of Simsbury Recycling Drop-Off Facility (GSI001083) showed high fecal coliform (colonies/100 ml) counts, which may be a potential industrial source of bacteria to Russell Brook. Farmington Public Works Facility (GSI001254), Polymer Resources, Ltd. (GSI000661) in Farmington, CT, Farmington Ready Mix (GSI000540), and New Hartford Public Works Facility (GSI001324) showed high fecal coliform (colonies/100 ml) counts. Further monitoring will provide information essential to better locate, understand, and reduce pollution sources. If any current monitoring is not done with appropriate bacterial indicator based on the receiving water, then a recommended change during the next permit reissuance is to include the appropriate indicator species. If facility monitoring indicates elevated bacteria, then implementation of permit required and voluntary measures to identify and reduce sources of bacterial contamination at the facility are an additional recommendation. Regular monitoring should be established for all permitted sources to ensure compliance with permit requirements and to determine if current requirements are adequate or if additional measures are necessary for water quality protection.

Section 6(k) of the MS4 General Permit requires a municipality to modify their Stormwater Management Plan to implement the TMDL within four months of TMDL approval by EPA if stormwater within the municipality contributes pollutant(s) in excess of the allocation established by the TMDL. For discharges to impaired waterbodies, the municipality must assess and modify the six minimum measures of its plan, if necessary, to meet TMDL standards. Particular focus should be placed on the following plan components: public education, illicit discharge detection and elimination, stormwater structures cleaning, and the repair, upgrade, or retrofit of storm sewer structures. The goal of these modifications is to establish a program that improves water quality consistent with TMDL requirements. Modifications to the Stormwater Management Plan in response to TMDL development should be submitted to the Stormwater Program of DEEP for review and approval.

Table 15 details the appropriate waste load allocations established in this TMDL for use as water quality targets for permittees as permits are renewed and updated, within the Farmington River watershed.

For any municipality subject to an MS4 permit and affected by a TMDL, the permit requires a modification of the SMP to include BMPs that address the included impairment. In the case of bacteria related impairments municipal BMPs could include: implementation or improvement to existing nuisance wildlife programs, septic system monitoring programs, any additional measures that can be added to the required illicit discharge detection and elimination (IDDE) programs, and increased street sweeping above basic permit requirements. Any non-MS4 municipalities can implement these same types of initiatives in effort to reduce bacteria source loading to impaired waterways.

Any facilities that discharge non-MS4 regulated stormwater should update their Pollution Prevention Plan to reflect BMPs that can reduce bacteria loading to the receiving waterway. These BMPs could include nuisance wildlife control programs and any installations that increase surface infiltration to reduce overall stormwater volumes. Facilities that are regulated under the Commercial Activities Stormwater Permit should report any updates to their SMP in their summary documentation submitted to DEEP.

Table 15. Bacteria (e.coli) TMDLs, WLAs, and LAs for Recreational Uses

| | | Instantaneous <i>E. coli</i> (#/100mL) | | | | | | Geometric Mean <i>E. coli</i> (#/100mL) | |
|----------------|--|--|------------------|------------------|------------------|------------------|------------------|---|------------------|
| Class | Bacteria Source | WLA ⁶ | | | LA ⁶ | | | WLA ⁶ | LA ⁶ |
| | Recreational Use | 1 | 2 | 3 | 1 | 2 | 3 | All | All |
| A | Non-Stormwater NPDES | 0 | 0 | 0 | | | | 0 | |
| | CSOs | 0 | 0 | 0 | | | | 0 | |
| | SSOs | 0 | 0 | 0 | | | | 0 | |
| | Illicit sewer connection | 0 | 0 | 0 | | | | 0 | |
| | Leaking sewer lines | 0 | 0 | 0 | | | | 0 | |
| | Stormwater (MS4s) | 235 ⁷ | 410 ⁷ | 576 ⁷ | | | | 126 ⁷ | |
| | Stormwater (non-MS4) | | | | 235 ⁷ | 410 ⁷ | 576 ⁷ | | 126 ⁷ |
| | Wildlife direct discharge | | | | 235 ⁷ | 410 ⁷ | 576 ⁷ | | 126 ⁷ |
| | Human or domestic animal direct discharge ⁵ | | | | 235 | 410 | 576 | | 126 |
| B ⁴ | Non-Stormwater NPDES | 235 | 410 | 576 | | | | 126 | |
| | CSOs | 235 | 410 | 576 | | | | 126 | |
| | SSOs | 0 | 0 | 0 | | | | 0 | |
| | Illicit sewer connection | 0 | 0 | 0 | | | | 0 | |
| | Leaking sewer lines | 0 | 0 | 0 | | | | 0 | |
| | Stormwater (MS4s) | 235 ⁷ | 410 ⁷ | 576 ⁷ | | | | 126 ⁷ | |
| | Stormwater (non-MS4) | | | | 235 ⁷ | 410 ⁷ | 576 ⁷ | | 126 ⁷ |
| | Wildlife direct discharge | | | | 235 ⁷ | 410 ⁷ | 576 ⁷ | | 126 ⁷ |
| | Human or domestic animal direct discharge ⁵ | | | | 235 | 410 | 576 | | 126 |

- (1) **Designated Swimming.** Procedures for monitoring and closure of bathing areas by State and Local Health Authorities are specified in: Guidelines for Monitoring Bathing Waters and Closure Protocol, adopted jointly by the Department of Environmental Protections and the Department of Public Health. May 1989. Revised April 2003 and updated December 2008.
- (2) **Non-Designated Swimming.** Includes areas otherwise suitable for swimming but which have not been designated by State or Local authorities as bathing areas, waters which support tubing, water skiing, or other recreational activities where full body contact is likely.
- (3) **All Other Recreational Uses.**
- (4) Criteria for the protection of recreational uses in Class B waters do not apply when disinfection of sewage treatment plant effluents is not required consistent with Standard 23. (Class B surface waters located north of Interstate Highway I-95 and downstream of a sewage treatment plant providing seasonal disinfection May 1 through October 1, as authorized by the Commissioner.)
- (5) Human direct discharge = swimmers
- (6) Unless otherwise required by statute or regulation, compliance with this TMDL will be based on ambient concentrations and not end-of-pipe bacteria concentrations
- (7) These values can be "as naturally occurs" if the only pollutant source is wildlife. Natural is defined as the biological, chemical and physical conditions and communities that occur within the environment which are unaffected or minimally affected by human influences (CT DEEP 2011a). Sections 2.2.2 and 6.2.7 of this Core Document deal with BMPs and delineating type of wildlife inputs.

2) Ensure there are sufficient buffers on agricultural lands along the Farmington River and its tributaries.

Agricultural land use represents 9% of the Farmington River watershed, and is a concern for water quality, particularly with the horse and cattle farms identified in Figure 6. If not already in place, agricultural producers should work with the CT Department of Agriculture and the U.S. Department of Agriculture Natural Resources Conservation Service to develop conservation plans for their farming activities within the watershed. These plans should focus on ensuring that there are sufficient stream buffers, that fencing exists to restrict livestock and horse access to streams and wetlands, and that animal waste handling, disposal, and other appropriate BMPs are in place.

3) Identify areas along the Farmington River and its tributaries to implement Best Management Practices (BMPs) to control stormwater runoff.

As noted previously, 26% of the Farmington River watershed is considered urban, and the Towns of Bloomfield, East Granby, Simsbury, Avon, Farmington, and Burlington are MS4 communities regulated by the MS4 program. The majority of the riparian area surrounding several of the impaired segments, including the Farmington River (Segment 2), Owens Brook, Russell Brook, and Minister Brook, is considered urban. As such, stormwater runoff is most likely contributing bacteria to the waterbodies.

To identify areas that are contributing bacteria to the impaired segments, the municipalities should continue to conduct wet-weather sampling at stormwater outfalls that discharge directly to the impaired segments in the Farmington River watershed. Outfalls that have previously shown high bacteria concentrations should be prioritized for BMP installation (Tables 5 and 8). To treat stormwater runoff, the municipalities should identify areas along the impaired segment to install BMPs designed to encourage stormwater to infiltrate into the ground before entering the waterbodies. These BMPs would disconnect impervious areas and reduce pollutant loads to the river. More detailed information and BMP recommendations can be found in the core TMDL document.

4) Evaluate municipal education and outreach programs regarding animal waste.

As most of the Farmington River watershed adjacent to the impaired segments is developed by residential areas, open spaces such as golf courses, and agricultural fields, any education and outreach program should highlight the importance of managing waste from horses, dogs, and other pets and not feeding waterfowl and wildlife. Municipalities and residents can take measures to minimize waterfowl-related impacts such as allowing tall, coarse vegetation to grow in the riparian areas of the Farmington River that are frequented by waterfowl. Waterfowl, especially grazers like geese, prefer easy access to water. Maintaining an uncut vegetated buffer along the shore will make the habitat less desirable to geese and encourage migration. In addition, any educational program should emphasize that feeding waterfowl, such as ducks, geese, and swans, may contribute to water quality impairments in the Farmington River and its tributaries and can harm human health and the environment. Animal wastes should be disposed of away from any waterbody or storm drain system. BMPs effective at reducing the impact of animal waste on water quality include installing signage, providing pet waste receptacles in high-use areas, enacting ordinances requiring the clean-up of pet waste, and targeting educational and outreach programs in problem areas.

5) Implement a program to evaluate the sanitary sewer system.

Much of the area surrounding the Farmington River (Segment 2), Russell Brook, and Minister Brook rely on the municipal sanitary sewer system with several portions subject to proposed sewer extensions

(Figure 6). It is important for municipalities to develop a program to evaluate its sanitary sewer for infiltration and inflow in the pipe network, as well as pump malfunctions, or other sources of potential leaks. This program should include periodic inspections of the sewer line.

6) Develop a system to monitor septic systems.

Portions of the Farmington River (Segment 2), Munnisunk Brook, and Owens Brook rely primarily on septic systems. If not already in place, Bloomfield, East Granby, Simsbury, Avon, Farmington, and Burlington should establish programs to ensure that existing septic systems are properly operated and maintained, and create an inventory of existing septic systems through mandatory inspections. Inspections help encourage proper maintenance and identify failed and sub-standard systems. Policies that govern the eventual replacement of sub-standard systems within a reasonable timeframe can be adopted. The municipalities should also develop a program to assist citizens with the replacement and repair of older and failing systems.

BACTERIA DATA AND PERCENT REDUCTIONS TO MEET THE TMDL**Table 16: Farmington River (Segment 2) Bacteria Data****Waterbody ID:** CT4300-00_02**Characteristics:** Freshwater, Class B, Habitat for Fish and other Aquatic Life and Wildlife, Recreation, and Industrial and Agricultural Water Supply**Impairment:** Recreation (*E. coli* bacteria)**Water Quality Criteria for *E. coli*:**

Geometric Mean: 126 colonies/100 mL

Single Sample: 410 colonies/100 mL

Percent Reduction to meet TMDL:Geometric Mean: **50%**Single Sample: **82%****Data:** 1998-1999, and 2009-2011 from CT DEEP targeted sampling efforts, 2012 TMDL Cycle**Single sample *E. coli* (colonies/100 mL) data from all monitoring stations on Farmington River (Segment 2) with annual geometric mean calculated**

| Station Name | Station Location | Date | Result | Wet/Dry | Geomean |
|--------------|-------------------------------------|------------|--------|---------|---------|
| 73 | Upstream of Old Farms Road crossing | 10/20/1998 | 20 | dry | NA |
| 73 | Upstream of Old Farms Road crossing | 3/30/1999 | 31 | dry | 91 |
| 73 | Upstream of Old Farms Road crossing | 6/15/1999 | 110 | wet | |
| 73 | Upstream of Old Farms Road crossing | 9/15/1999 | 220 | wet | |
| 1761 | Farmington River at Tariffville | 10/15/2009 | 23 | wet | 179 |
| 1761 | Farmington River at Tariffville | 12/23/2009 | 1400 | dry | |
| 1761 | Farmington River at Tariffville | 2/22/2010 | 1200 | dry | 79 |
| 1761 | Farmington River at Tariffville | 4/14/2010 | 14 | dry | |
| 1761 | Farmington River at Tariffville | 6/10/2010 | 75 | wet | |
| 1761 | Farmington River at Tariffville | 7/12/2010 | 120 | dry | |
| 1761 | Farmington River at Tariffville | 8/13/2010 | 24 | dry | |
| 1761 | Farmington River at Tariffville | 9/2/2010 | 46 | dry | |
| 1761 | Farmington River at Tariffville | 10/14/2010 | 68 | wet | |
| 1761 | Farmington River at Tariffville | 12/21/2010 | 130 | dry | |

Single sample *E. coli* (colonies/100 mL) data from all monitoring stations on Farmington River (Segment 2) with annual geometric mean calculated (continued)

| Station Name | Station Location | Date | Result | Wet/Dry | Geomean |
|--|---------------------------------|-----------|----------------|---------|---------------|
| 1761 | Farmington River at Tariffville | 2/18/2011 | 310 | unknown | 253* (50%) |
| 1761 | Farmington River at Tariffville | 4/25/2011 | 31 | unknown | |
| 1761 | Farmington River at Tariffville | 6/23/2011 | 580 | unknown | |
| 1761 | Farmington River at Tariffville | 7/21/2011 | 55 | unknown | |
| 1761 | Farmington River at Tariffville | 8/17/2011 | 310 | unknown | |
| 1761 | Farmington River at Tariffville | 8/29/2011 | 2300* (82%) | unknown | |
| 1761 | Farmington River at Tariffville | 9/28/2011 | 300 | unknown | |
| Shaded cells indicate an exceedance of water quality criteria | | | | | |
| †Average of two duplicate samples | | | | | |
| ** Weather conditions for selected data taken from Hartford because local station had missing data | | | | | |
| *Indicates single sample and geometric mean values used to calculate the percent reduction | | | | | |

Wet and dry weather geometric mean values for all monitoring stations on Farmington River (Segment 2)

| Station Name | Station Location | Years Sampled | Number of Samples | | Geometric Mean | | |
|--|-------------------------------------|---------------|-------------------|-----|----------------|-----|-----|
| | | | Wet | Dry | All | Wet | Dry |
| 73 | Upstream of Old Farms Road crossing | 1998-1999 | 2 | 2 | 62 | 156 | 25 |
| 1761 | Farmington River at Tariffville | 2009-2011 | 3 | 7 | 140 | 49 | 122 |
| Shaded cells indicate an exceedance of water quality criteria Weather condition determined from rain gage at the Hartford Bradley International Airport | | | | | | | |

Table 17: Munnisunk Brook Bacteria Data**Waterbody ID:** CT4300-44_01**Characteristics:** Freshwater, Class A, Potential Drinking Water Supplies, Habitat for Fish and other Aquatic Life and Wildlife, Recreation, Navigation, and Industrial and Agricultural Water Supply**Impairment:** Recreation (*E. coli* bacteria)**Water Quality Criteria for *E. coli*:**

Geometric Mean: 126 colonies/100 mL

Single Sample: 410 colonies/100 mL

Percent Reduction to meet TMDL:Geometric Mean: **96%**Single Sample: **97%****Data:** 2007-2009 from CT DEEP targeted sampling efforts, 2012 TMDL Cycle**Single sample *E. coli* (colonies/100 mL) data from Station 2445, 2446, and 2447 on Munnisunk Brook with annual geometric mean calculated**

| Station Name | Station Location | Date | Results | Wet/Dry | Geomean |
|--------------|-------------------------------------|-----------|---------|---------|---------|
| 2445 | Upstream of bend at Town Farm Dairy | 6/4/2007 | 2420 | wet | 858 |
| 2445 | Upstream of bend at Town Farm Dairy | 6/18/2007 | 313 | dry | |
| 2445 | Upstream of bend at Town Farm Dairy | 7/2/2007 | 1081 | dry | |
| 2445 | Upstream of bend at Town Farm Dairy | 7/16/2007 | 1450 | dry | |
| 2445 | Upstream of bend at Town Farm Dairy | 8/13/2007 | 529 | dry | |
| 2445 | Upstream of bend at Town Farm Dairy | 8/27/2007 | 317 | dry | |
| 2445 | Upstream of bend at Town Farm Dairy | 9/10/2007 | 1789 | dry | |
| 2445 | Upstream of bend at Town Farm Dairy | 9/17/2007 | 657 | dry | |
| 2445 | Upstream of bend at Town Farm Dairy | 9/24/2007 | 301 | dry | |
| 2445 | Upstream of bend at Town Farm Dairy | 10/1/2007 | 3076 | dry | |

Single sample *E. coli* (colonies/100 mL) data from Station 2445, 2446, and 2447 on Munnisunk Brook with annual geometric mean calculated (continued)

| Station Name | Station Location | Date | Results | Wet/Dry | Geomean |
|--|-------------------------------------|-----------|-----------------|---------|----------------|
| 2445 | Upstream of bend at Town Farm Dairy | 6/9/2008 | 2481 | wet | 3361* (96%) |
| 2445 | Upstream of bend at Town Farm Dairy | 6/23/2008 | 15331* (97%) | wet | |
| 2445 | Upstream of bend at Town Farm Dairy | 7/7/2008 | 1259 | dry | |
| 2445 | Upstream of bend at Town Farm Dairy | 7/21/2008 | 14136 | wet | |
| 2445 | Upstream of bend at Town Farm Dairy | 8/4/2008 | 933 | dry | |
| 2445 | Upstream of bend at Town Farm Dairy | 8/18/2008 | 2282 | dry | |
| 2445 | Upstream of bend at Town Farm Dairy | 6/29/2009 | 72 | dry | 67 |
| 2445 | Upstream of bend at Town Farm Dairy | 7/13/2009 | 62 | dry | |
| 2446 | Rail Trail crossing | 9/10/2007 | 213 | dry | 21 |
| 2446 | Rail Trail crossing | 9/17/2007 | 10 | dry | |
| 2446 | Rail Trail crossing | 9/24/2007 | 10 | dry | |
| 2446 | Rail Trail crossing | 10/1/2007 | 10 | dry | |
| 2447 | Route 10 crossing | 9/10/2007 | 52 | dry | 15 |
| 2447 | Route 10 crossing | 9/17/2007 | 10 | dry | |
| 2447 | Route 10 crossing | 9/24/2007 | 10 | dry | |
| 2447 | Route 10 crossing | 10/1/2007 | 10 | dry | |
| Shaded cells indicate an exceedance of water quality criteria | | | | | |
| *Indicates single sample and geometric mean values used to calculate the percent reduction | | | | | |

Wet and dry weather geometric mean values for Stations 2445, 2446, and 2447 on Munnisunk Brook

| Station Name | Station Location | Years Sampled | Number of Samples | | Geometric Mean | | |
|--|-------------------------------------|---------------|-------------------|-----|----------------|------|-----|
| | | | Wet | Dry | All | Wet | Dry |
| 2445 | Upstream of bend at Town Farm Dairy | 2007-2009 | 4 | 14 | 1019 | 6006 | 614 |
| 2446 | Rail Trail crossing | 2007 | 0 | 4 | 21 | NA | 21 |
| 2447 | Route 10 crossing | 2007 | 0 | 4 | 15 | NA | 15 |
| Shaded cells indicate an exceedance of water quality criteria | | | | | | | |
| Weather condition determined from rain gage at the Hartford Bradley International Airport | | | | | | | |

Table 18: Owens Brook Bacteria Data**Waterbody ID:** CT4300-39_01**Characteristics:** Freshwater, Class A, Potential Drinking Water Supplies, Habitat for Fish and other Aquatic Life and Wildlife, Recreation, Navigation, and Industrial and Agricultural Water Supply**Impairment:** Recreation (*E. coli* bacteria)**Water Quality Criteria for *E. coli*:**

Geometric Mean: 126 colonies/100 mL

Single Sample: 410 colonies/100 mL

Percent Reduction to meet TMDL:Geometric Mean: **85%**Single Sample: **98%****Data:** 2007-2009 from CT DEEP targeted sampling efforts, 2012 TMDL Cycle**Single sample *E. coli* (colonies/100 mL) data from Station 1637 on Owens Brook with annual geometric mean calculated**

| Station Name | Station Location | Date | Results | Wet/Dry | Geomean |
|--------------|-------------------------------|-----------|---------------------|---------|------------|
| 1637 | Upstream of Route 10 crossing | 6/4/2007 | 24120 | wet | 462 |
| 1637 | Upstream of Route 10 crossing | 6/18/2007 | 194 | dry | |
| 1637 | Upstream of Route 10 crossing | 7/2/2007 | 156 | dry | |
| 1637 | Upstream of Route 10 crossing | 7/16/2007 | 63 | dry | |
| 1637 | Upstream of Route 10 crossing | 8/13/2007 | 272 | dry | |
| 1637 | Upstream of Route 10 crossing | 8/27/2007 | 780 | dry | |
| 1637 | Upstream of Route 10 crossing | 6/9/2008 | 426 | wet | 829* (85%) |
| 1637 | Upstream of Route 10 crossing | 6/23/2008 | 24196* (98%) | wet | |
| 1637 | Upstream of Route 10 crossing | 7/7/2008 | 259 | dry | |
| 1637 | Upstream of Route 10 crossing | 7/21/2008 | 1723 | wet | |
| 1637 | Upstream of Route 10 crossing | 8/4/2008 | 448 | dry | |
| 1637 | Upstream of Route 10 crossing | 8/18/2008 | 158 | dry | |

Single sample *E. coli* (colonies/100 mL) data from Station 1637 on Owens Brook with annual geometric mean calculated (continued)

| Station Name | Station Location | Date | Results | Wet/Dry | Geomean |
|--|-------------------------------|-----------|---------|---------|---------|
| 1637 | Upstream of Route 10 crossing | 6/1/2009 | 10 | dry | 127 |
| 1637 | Upstream of Route 10 crossing | 6/15/2009 | 249 | wet | |
| 1637 | Upstream of Route 10 crossing | 6/29/2009 | 203 | dry | |
| 1637 | Upstream of Route 10 crossing | 7/13/2009 | 171 | dry | |
| 1637 | Upstream of Route 10 crossing | 7/27/2009 | 435 | wet | |
| 1637 | Upstream of Route 10 crossing | 8/10/2009 | 52 | dry | |
| 1637 | Upstream of Route 10 crossing | 8/24/2009 | 279 | wet | |
| Shaded cells indicate an exceedance of water quality criteria | | | | | |
| *Indicates single sample and geometric mean values used to calculate the percent reduction | | | | | |

Wet and dry weather geometric mean values for Station 1637 on Owens Brook

| Station Name | Station Location | Years Sampled | Number of Samples | | Geometric Mean | | |
|--|-------------------------------|---------------|-------------------|-----|----------------|------|-----|
| | | | Wet | Dry | All | Wet | Dry |
| 1637 | Upstream of Route 10 crossing | 2007-2009 | 7 | 12 | 306 | 1038 | 150 |
| Shaded cells indicate an exceedance of water quality criteria Weather condition determined from rain gage at the Hartford Bradley International Airport | | | | | | | |

Table 19: Russell Brook Bacteria Data**Waterbody ID:** CT4300-33_01**Characteristics:** Freshwater, Class A, Potential Drinking Water Supplies, Habitat for Fish and other Aquatic Life and Wildlife, Recreation, Navigation, and Industrial and Agricultural Water Supply**Impairment:** Recreation (*E. coli* bacteria)**Water Quality Criteria for *E. coli*:**

Geometric Mean: 126 colonies/100 mL

Single Sample: 410 colonies/100 mL

Percent Reduction to meet TMDL:Geometric Mean: **71%**Single Sample: **97%****Data:** 2007-2009 from CT DEEP targeted sampling efforts, 2012 TMDL Cycle**Single sample *E. coli* (colonies/100 mL) data from Station 2449 on Russell Brook with annual geometric mean calculated**

| Station Name | Station Location | Date | Results | Wet/Dry | Geomean |
|--------------|---|-----------|-----------------|---------|---------------|
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 6/11/2007 | 145 | dry | 190 |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 6/25/2007 | 86 | dry | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 7/9/2007 | 426 | dry | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 7/23/2007 | 275 | wet | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 8/6/2007 | 161 | dry | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 8/20/2007 | 199 | dry | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 6/2/2008 | 52 | dry | 431* (71%) |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 6/16/2008 | 135 | wet | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 6/30/2008 | 2613 | wet | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 7/14/2008 | 12033* (97%) | wet | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 7/28/2008 | 379 | wet | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 8/11/2008 | 301 | wet | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 8/25/2008 | 109 | dry | |

Single sample *E. coli* (colonies/100 mL) data from Station 2449 on Russell Brook with annual geometric mean calculated (continued)

| Station Name | Station Location | Date | Results | Wet/Dry | Geomean |
|--|---|-----------|---------|---------|---------|
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 6/8/2009 | 10 | dry | 167 |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 6/22/2009 | 259 | wet | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 7/6/2009 | 121 | dry | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 7/20/2009 | 1198 | dry | |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 8/3/2009 | 345 | wet | |
| Shaded cells indicate an exceedance of water quality criteria | | | | | |
| *Indicates single sample and geometric mean values used to calculate the percent reduction | | | | | |

Wet and dry weather geometric mean values for Station 2449 on Russell Brook

| Station Name | Station Location | Years Sampled | Number of Samples | | Geometric Mean | | |
|---|---|---------------|-------------------|-----|----------------|-----|-----|
| | | | Wet | Dry | All | Wet | Dry |
| 2449 | Downstream of Weatogue Park and Route 10 crossing | 2007-2009 | 8 | 10 | 252 | 575 | 130 |
| Shaded cells indicate an exceedance of water quality criteria | | | | | | | |
| Weather condition determined from rain gage at the Hartford Bradley International Airport | | | | | | | |

Table 20: Minister Brook Bacteria Data**Waterbody ID:** CT4300-32_01**Characteristics:** Freshwater, Class A, Potential Drinking Water Supplies, Habitat for Fish and other Aquatic Life and Wildlife, Recreation, Navigation, and Industrial and Agricultural Water Supply**Impairment:** Recreation (*E. coli* bacteria)**Water Quality Criteria for *E. coli*:**

Geometric Mean: 126 colonies/100 mL

Single Sample: 410 colonies/100 mL

Percent Reduction to meet TMDL:Geometric Mean: **84%**Single Sample: **96%****Data:** 2007-2009 from CT DEEP targeted sampling efforts, 2012 TMDL Cycle**Single sample *E. coli* (colonies/100 mL) data from Station 2448 on Minister Brook with annual geometric mean calculated**

| Station Name | Station Location | Date | Results | Wet/Dry | Geomean |
|--------------|--|-----------|-----------------|---------|---------------|
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 6/11/2007 | 1553 | dry | 90 |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 6/25/2007 | 108 | dry | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 7/9/2007 | 30 | dry | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 7/23/2007 | 20 | wet | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 8/6/2007 | 84 | dry | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 8/20/2007 | 63 | dry | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 6/2/2008 | 201 | dry | 770* (84%) |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 6/16/2008 | 173 | wet | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 6/30/2008 | 5794 | wet | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 7/14/2008 | 11199* (96%) | wet | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 7/28/2008 | 1421 | wet | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 8/11/2008 | 960 | wet | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 8/25/2008 | 52 | dry | |

Single sample *E. coli* (colonies/100 mL) data from Station 2448 on Minister Brook with annual geometric mean calculated (continued)

| Station Name | Station Location | Date | Results | Wet/ Dry | Geomean |
|--|--|-----------|---------|----------|---------|
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 6/8/2009 | 265 | dry | 727 |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 6/22/2009 | 2046 | wet | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 7/6/2009 | 554 | dry | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 7/20/2009 | 650 | dry | |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 8/3/2009 | 1043 | wet | |
| Shaded cells indicate an exceedance of water quality criteria | | | | | |
| *Indicates single sample and geometric mean values used to calculate the percent reduction | | | | | |

Wet and dry weather geometric mean values for Station 2448 on Minister Brook

| Station Name | Station Location | Years Sampled | Number of Samples | | Geometric Mean | | |
|---|--|---------------|-------------------|-----|----------------|-----|-----|
| | | | Wet | Dry | All | Wet | Dry |
| 2448 | Downstream of Latimer Lane and Route 10 intersection | 2007-2009 | 8 | 10 | 371 | 948 | 175 |
| Shaded cells indicate an exceedance of water quality criteria | | | | | | | |
| Weather condition determined from rain gage at the Hartford Bradley International Airport | | | | | | | |

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